DOCUMENT RESUME

ED 224 202 EC 150 384

AUTHOR Gough, J. Eric; McBeath, Clare
TITLE An Evaluation of the Disabled Students Learning Project at Deakin University.
INSTITUTION Deakin Univ., Victoria (Australia).
SPONS AGENCY Tertiary Education Commission, Canberra (Australia).
PUB DATE Dec 81
NOTE 62p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adults; Blindness; College Students; Course Content; Equipment; Foreign Countries; *Instructional Materials; Low Vision Aids; *Material Development; Partial Hearing; Physical Disabilities; Postsecondary Education; Program Costs; *Program Evaluation; *Severe Disabilities
IDENTIFIERS *Australia; *Deakin University (Australia)

ABSTRACT

A project to adapt learning materials and provide support services for severely disabled persons 22-76 years old in Australia is described and evaluation data presented. Disabilities of the eight students included total blindness, severe physical disability, and partial deafness. Three courses were chosen for adaptation: "Images of Man," "Imperialism--Expansion of Europe," and "Introduction to Psychology." Procedures for transforming print material were developed (examples of modification for low vision students are appended). The evaluation concluded that the project was successful despite delays caused by machine modification problems and despite the additional cost incurred. (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED224202

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

An Evaluation of the Disabled Students Learning Project at Deakin University

J. Eric Gough and Clare McBeath

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. E. Gough

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Deakin University
Geelong
Victoria 3217
December 1981

EC150384

EC150384

Contents

		page
ACKNOWLEDGEMENTS		i
PREFACE		iii
PART I	SETTING UP THE PROJECT	1
	Introduction	1
	The Investigative Stage — 1979	2
	The Developmental Stage — 1980	3
	The Pilot Project — 1981	7
PART II	EQUIPMENT AND MATERIALS	11
	Transforming Print Material	11
	Recording and Indexing	12
	Raised Models	13
	Self-Work/Note-taker tapes	13
	Large Type Electric Typewriters	13
	Multiple Choice Answer Box	14
	Costs	14
	Planned Developments	15
PART III	THE PROJECT IN OPERATION	17
	Value of the Project	18
	Equipment and Materials	19
	Study Skills and Needs	23
PART IV	DISCUSSION AND RECOMMENDATIONS	27
	The Project	27
	Materials	28
	Student Problems	29
	Administration and Organisation	31
PART V	THE STUDENTS (Eight Case Studies)	35
CONCLUSION		43

Acknowledgements

As this is the first published report about the disabled students' project since the project began, acknowledgements extend beyond the investigation reported here. Without the assistance of the people and organisations mentioned here the project could not have developed to the point where an evaluation was relevant. Their assistance is gratefully acknowledged.

The late Lady Vera White and her family for their concern for the disabled and their generous gifts which led to the project being initiated.

The Vice Chancellor, Professor F.R. Jevons for his support and encouragement from the beginning.

The Royal Victorian Institute for the Blind (RVIB) and in particular to Mrs Margaret Fialides and her coworkers without whose help the project could not have reached its present stage of development.

Jenny Townsend and Brenda King who have worked with the project from the beginning and Stanley Croker who joined me as coordinator.

Lloyd Junor who has served as a consultant and whose technical expertise will add new dimensions to the project.

The Beckworth Court Pastoral Co. Pty. Ltd. (Buckland Foundation) for its support of professional drama productions to enliven the learning experiences of students in the project.

The Alexander Trust for its support in the initial stages of the project.

The International Year of the Disabled Persons' funding authority which supported the purchase of equipment.

Dr Maxine Briggs (Geelong Hospital), Mrs Jane Nichols (Caulfield Hospital), Mr Keith Holdsworth (Royal Guide Dogs Association of Australia), Mr Brian Kidd (University of Melbourne), Mr Frank Stephens (Royal Children's Hospital) and Mr Erich Krell (Blackwood, SA) all of whom displayed interest in the project and gave advice and encouragement when needed.

The academic staff of Deakin University who in varying measures have added considerably to their own workloads in order to meet the needs of disabled students participating in the project.

The assistance of the Tertiary Education Commission under whose evaluative studies program this study was funded and the work of Clare McBeath who was commissioned to do the study. The task of evaluation is not yet complete but her report has opened up many issues which will be explored in further detail.

There are others who from time to time have made contributions and whilst they have not been named their help has been appreciated.

Finally, my own staff, Fay Warby and Jenni Vaughan, and Cojan Newhouse and Trevor Pickles from the Deakin University Production Unit who prepared the report for publication.

Abstract

Deakin University has been engaged in an experimental program adapting learning materials and providing support services for severely disabled students. The aim of the project is to provide educationally equivalent learning experiences so that the disabled student can enjoy as full and as satisfying a university education as the non disabled student.

In 1981 eight students were admitted under the aegis of the program. All were female. Three had enrolled previously. Six lived in Melbourne, one at Bacchus Marsh and one on the South Victorian coast. Their ages ranged from 22 to 76. Their disabilities included total blindness since birth, total blindness in adulthood, vision restricted in adulthood, severe muscular disability and partial deafness. Three courses were specially adapted — *Introduction to Psychology*, *Images of Man*, and *Imperialism*. Each course presented markedly different problems in adaptation.

The present report is concerned with evaluating the project. A part time course developer undertook the evaluation largely by examining the files, interviewing the part time research assistants working in the program, and by interviewing students.

The results show that materials can be adapted successfully, appropriate support services provided and technological aids devised to allow severely disabled students to enjoy university study. It is also clear that the institution admitting disabled students and making such provision for them incurs additional cost. Furthermore, it is apparent that over time skill and expertise develops both in dealing with disabled students and in adapting materials. In addition, there is scope for cooperation and collaboration between institutions and organisations working with the disabled.

Finally, the evaluation reveals that while the project can be adjudged successful, its development should be carefully controlled and monitored because of the demands it makes on institutional resources.

Preface

The literature on disability is immense. It ranges from concerns with physical access to buildings, through questions about the psychological effects of disabilities on the individual, to the whole question of making it possible for the severely disabled to achieve an optimal measure of independent living.

This report describes a project which is related to all of these questions although initially it might seem much more limited in scope. It is concerned with making available to severely disabled people opportunities for study at university level. Inevitably, however, its compass becomes much broader because the disabled person lives and works within a context that influences the ways in which the individual adjusts to the role of a university student.

The Project

The project is concerned therefore not only with securing the admission of disabled people to the university but with providing support to maximise the disabled student's chances of success.

There is a certain boldness in the concept because it deals with intellectually able people who, had they not been disabled, might have expected to complete a university education. It does this without demanding any specific previous educational experience, without placing limits on the seriousness of disability, with little concern about age, and placing few if any geographical constraints on students. Naturally, it does have concerns for the health and welibeing of students in the program and care is taken to ensure that the demands of study do not overtax students.

Terminology

It is not the concern of this report to enter the semantic debate which revolves around terminology. The International Year of Disabled Persons has already highlighted the unacceptability of the term 'handicapped' by its replacement with the term 'disabled'. Perhaps even that label might one day disappear. For the purposes of this study the description of the terms *impairment*, *disability* and *handicap* as appearing in the Report of the Comprehensive Service Needs Study (1975) carried out for the Department of Health, Education and Welfare by the Urban Institute, Washington are taken as a starting point.

In discussing these terms that report says:

> *Impairments* may or may not lead to important functional limitations. Consider, for example, the case of a Vietnam veteran who loses his leg in combat and completes law school under the GI Bill and now practices tax law, earning $30 000 per year. Had that veteran been a truck driver prior to his impairment, his entire earnings and work strategy might have been different.
>
> When the impairment leads to functional limitations in the ability to care for oneself or to perform the key expected social roles—especially with respect to work—and when the condition has some durational implication, the impairment may then be described as a *disability*.
>
> Thus, society and the individual react to the disability and define the conditions where it becomes a *handicap*. A handicap is an event or environmental condition which interacts with the disabled person, causing a barrier to goal accomplishment that a non-disabled person may not face, and which would not impede the disabled person if the world could change.
>
> For most non-disabled persons, a sidewalk curb is not an impediment to crossing a street. For many of the disabled, however, it is like a wall to be hurdled . . . A paraplegic may have a handicap when curbs are high and none when curb cuts permit ease of access. Also, for most of us the placement of a public telephone in a booth is no problem; a person in a wheelchair finds the booth too narrow for access and the telephone too high to reach.
>
> Our preference is to call the residual limitation resulting from congenital defect, disease, or injury an *impairment*. A person with an impairment, then, may or may not have a *disability*, an inability to perform some key life functions. When the inability is such that the environment imposes impediments to the individual's goals for travel or work, for example, the individual has a *handicap*.
>
> Report of the Comprehensive Service Needs Study, 1975, pp. 23-4

Potential Numbers

It is interesting to speculate about the size of the population of severely disabled students for whom a program such as the one reported here might prove interesting and appropriate. 'Speculate' is used advisedly. There seems to be a paucity of reliable information. The Australian Bureau of Statistics is producing reports on disability derived from information obtained in the last census. At the time of writing only very preliminary information is available.

In the US in 1975 by using the most reliable estimates from a number of studies judged to be methodologically sound, it was estimated that there were 10 067 000 people who could be categorised as 'most severely handicapped'. (Report of the Comprehensive Service Needs Study, 1975, p. 772) By eliminating a proportion of these for whom university study is not a

realistic option and by estimating for the remainder a participation rate in tertiary study not greatly dissimilar to that of the population at large, it is suggested that some ten percent or roughly a million disabled people in the US might be considered as having the potential for college or university education. If these figures were applied roughly to the Australian population, there could be as many as 60 000 severely disabled people in Australia who might well have the potential to engage in higher education. Even if the correct figure is considerably smaller, the pool of potential students is of sufficient size to merit attention.

Higher education and employability

An immediate question is raised concerning the vocational relevance of higher education for the disabled. It is not within the scope of this report to deal with an issue of such magnitude. There is no question that employability is a major concern for the disabled. It is equally true that many want to work and are capable of working, but find it difficult to secure employment. Nor is it easy to see how this situation will be remedied in the short term given the physical limitations of the disabled, their socio-economic status in general, the pool of able bodied unemployed with whom they must compete, lack of incentives provided for the potential employer and perhaps even more importantly, the prevailing attitude of the community in general and of employers in particular towards the disabled. Despite all of these negative factors it must still be true that a disabled person with a university qualification, the possession of which is convincing demonstration of ability, determination and courage, must have more scope for employment than would be the case without it. This may be as true for the generalist type of qualification as it is for the more specialised.

It is not possible to deal with such broader contextual issues in even the most cursory fashion. Those issue are real, however, and in the long term a project such as the one described here must take account of them. For the moment however, this report is concerned with evaluating a project designed to extend educational opportunities for severely disabled students at university level.

The Centre

With respect to the project itself it may help if it is understood that the project is located within the Centre for Educational Services (CES) at Deakin University. It may also help if it is realised that the project itself is seen as a 'learning centre'. It has a physical location, working space and equipment, stock and materials and staff, albeit part time. Thus the project is often referred to as 'the Centre' and indeed this is done in the following report.

Finally it is necessary to emphasise that the project is not only concerned with doing what is necessary to allow disabled students, if their performance is deserving, to pass examinations. Rather it is also an attempt to provide them with equivalent educational and learning experiences so that they may enjoy the same quality of education as their non-disabled counterparts.

Part 1
Setting up the Project

Introduction

In February 1980 an article appeared in *Rehabilitation in Australia*[1] outlining Deakin University's plans for a resource centre for disabled students. The Centre was to attempt to solve some of the problems caused by various physical disabilities of those who wished to engage in higher academic study. It aimed to modify teaching materials and mechanical aids, to set up specialist counselling and teaching support, and to initiate special administrative arrangements with individual students. These innovations, it was hoped, would enable them to cope with the requirements of off campus degree level study without undue demands on the people with whom they lived.

The article invited enquiries from potential students with visual, aural, manual, mobility and speech difficulties, and from other interested persons working in this area.

With its innovative off campus study program already highly developed, Deakin University was in a unique position to modify existing printed course materials in a variety of new ways to allow disabled people to benefit from them.

The project represented a significant attempt by an Australian university to do something substantial, and on a continuing basis, for the disabled.

The idea however, had not emerged fully developed as it appeared in the article. The first seeds had been sown several years earlier when Lady Vera White gave $1 000 to the university for the education of a disabled student. In considering how to use the gift the Dean of Educational Services proposed a more ambitious project. During 1978 a number of organisations and individuals interested in education for the disabled were contacted, and with 1981 planned as the International Year of Disabled Persons, the concept was given greater impetus. This process was described as the 'investigative stage'.

---

[1] Gough, Eric, 'Educational Access is More than Wide Doors', *Rehabilitation in Australia*, February 1980, pp. 117-49

Proformas for disabled students were included with the 1980 enrolment papers, and were completed by thirty-six people. An analysis of these made it possible to assess the demand for higher education among the disabled and to decide the sort of materials modification the centre should consider if it were to cater for this need and expand the service to others.

Of the thirty-six, thirteen described hearing disabilities of varying degrees; fourteen had muscular problems or amputations which interfered with handwriting or made physical access to campus facilities difficult; three were on drugs which impaired concentration; five mentioned visual handicap and four more had multiple sclerosis with both muscular and visual restrictions. As these students had all enrolled in courses for 1980, presumably all were intending to cope with their study using the facilities already available to them. Some intended to ask for special consideration in doing written examinations because of fatigue during long periods of writing, and some reported having done individually supervised examinations in the past.

Priorities had to be established by the Centre regarding the type of materials it would concentrate on in its pilot program. Hearing- and mobility-restricted students could use the existing course books and readers and the off campus home study mode in virtually the same way as other isolated students. Attendance at weekend schools, tutorial or telephone contact and provision for writing exams were identified as their major needs. Deaf students would require the relatively easy reproduction of typescripts from audiotapes where they were part of their course. The highest priority group, however, appeared to be the visually handicapped, as the greatest part of all courses is in printed form. Various students reported studying with thick lenses or magnifying glasses, not being able to 'read across the line', and 'suffering from headache and fatigue' when they studied. Twenty-five percent of the 1980 enrolment sample described low vision disability.[2]

The transformation of printed course material into a non visual form, therefore, appeared as the first priority of the proposed Project.

From the inceptual stages, the need to develop teaching and counselling support seem obvious. One of the main services the Centre would have to offer handicapped students was that of talking to, advising and encouraging them, gathering feedback, and helping with their practical and emotional problems. Centre personnel would have to liaise between course team members, administration staff and students. Perhaps it was not fully realised at this stage that this could become the most demanding part of the project, and would require considerable sensitivity and initiative on the part of the staff.

---

[2] Notably there were no totally blind students in that group, as it would have been virtually impossible to undertake university level study where so much course work was in print form. Totally blind students undertaking university level work, would not have chosen Deakin University's non-lecture mode as their method of study.

At this stage the project was under the sole control of the Dean of Educational Services, and he opened up contacts in all possible directions to ascertain the feasibility of the Project. The National Advisory Council for the Handicapped (Canberra), the Adult Deaf Society of Victoria, the Yooralla Society of Victoria and the Royal Victorian Institute for the Blind[3] were all informed of the proposed project and their advice and support requested.

The Universities of Queensland and Melbourne, and Flinders University in South Australia were discovered to be engaged in research into the area of higher education for the disabled, and contact was made with the researchers and ideas exchanged. The National Library was asked about the work of its Library Services for the Handicapped section. The Royal Children's Hospital, Caulfield Hospital, the Geelong Hospital Rehabilitation Unit and the Illawarra Community Centre, Geelong, were contacted and their advice sought. Further discussions were initiated with local Special Schools, doctors and welfare officers. Information on equipment for the disabled was collected, and the university's Building Manager advised to consider disabled students in all future building projects.

The Deans of the three major schools in the off campus program—Social Sciences, Humanities and Education- were consulted, and it was decided to select one course from each to see whether it could be adapted for blind students. The original choice included:

HU 100	Images of Man
SS 103	Imperialism: Clash of Cultures
ED 212	Developmental Psychology

Two of these were eventually changed. *Introduction to Psychology* was a pre-requisite course for *Developmental Psychology*, and obviously had to be offered before the latter. *Imperialism: The Expansion of Europe* was chosen because it was the first semester unit of a two semester course, and would normally be offered before *Clash of Cultures*. Thus, materials modification began finally on:

HU 100	Images of Man
SS 102	Imperialism: Expansion of Europe
ED 102	Introduction to Psychology

It was decided that if they could be realistically adapted, a small pilot project should be set up for the second semester of 1980. The three courses would be offered to selected blind or low vision students, who would become part of the testing program. It was originally intended that they take two semesters to cover the one semester course, catching up and slotting in with the normal program in the second semester of 1981. This did not occur, as it turned out.

The Developmental Stage 1980

An Educational Consultant, C. Lloyd Junor, was employed by the University to recommend technical procedures and commercially available equipment

---

[3] Referred to hereafter as RVIB

which could be used by the Centre in the pilot stages of the Project and in the future. Mr Junor also examined the three courses and advised on their adaptation.

At the same time two research assistants were employed for fifteen hours a week to begin adapting the study material. Initially their brief was to read the courses and make notes on the obvious problem areas. From there major procedural decisions could be made.

On the advice of RVIB and of Open University staff working in the area of higher education for the blind, the use of braille was rejected. It is voluminous and expensive to produce, and the number of blind people with brailling skills is known to be too small to make it worthwhile. It was decided that some braille could be used for headings or labels where it was considered necessary. All other material would have to be reproduced in a way which could be understood by hearing or touch.

The bulk of textual material could be recorded on audiotape, but to reduce the sheer amount of continuous listening, a variety of presentation methods was suggested. These could include dramatic segments, music, sound effects and the use of contrasting voices. Long or repetitious passages could be deleted or simplified, although care had to be taken that the course remained essentially the same as that taken by sighted students. Pictures, maps, diagrams and tables would have to be approached as a tactile problem, or partly tactile and partly aural. The production of raised models was suggested, some to be used *per se*, and others requiring verbal explanation or description. Self testers and exercises included the completion of complicated tables, objective multiple choice tests, and questionnaires requiring frequent reference to the text, a map or a table. All such exercises would have to be examined individually for alternative presentation forms.

Images of Man proved the easiest course to adapt in that there were no diagrams, maps or charts. It was mainly a matter of having the Study Guides, Readers and texts read onto audiotape. The section on drama was fairly strongly visually biased in its presentation, so the research assistant concerned discussed with the writer how the visual element might be eliminated or adapted. All course team writers were consulted on adapting the questions and self-testing exercises at the end of each section. By early May, Unit A of *Images of Man* was ready for audiotaping.

The other research assistant established early contact with the *Imperialism* course team, and a meeting was called to discuss the problems of modifying it. The *Imperialism* course included thirty-six maps, graphs and diagrams which had to be adapted so they could be studied by touch. Tactile learning models had to be designed. The quantity of printed material was enormous. The course included three Study Guides and three Readers, as well as a reference bibliography. Members of the course team were cooperative and agreed to assist with deleting and changing material, adapting exercises, simplifying maps and diagrams where possible, and by reading their own work on to audiotape.

Introduction to Psychology proved even more difficult. The first semester course included three activities-orientated Workbooks, consisting almost entirely of problems and exercises based on tables, diagrams and graphs. The course team assisted in extensive modification or deletion of diagrams and graphs, and advised on methods of reading tapes, but they had problems of their own in trying to produce the course for non-disabled students for the first time in 1980. Pagination errors, disorganisation of course components and inconsistencies in text edition references, which eventually were eliminated from the 1981 printed course, still remained in the materials adapted for low vision students. The two supporting text books, furthermore, were enormous, and ran into sixty hours of tape recording. This course was the most difficult of the three, and took the longest time to modify.

Meanwhile a steering committee was set up on a preliminary discussion basis. It consisted of interested people from the Illawarra Community Centre, RVIB, the Royal Guide Dogs for the Blind Association of Australia, Caulfield Hospital, the University of Melbourne, and staff of the Centre at Deakin University. It met in the RVIB Board Room in Melbourne. This committee in fact met only once, and provided valuable liaison.

From the meeting however, it had become obvious that the Centre should ensure that tape recorders and recording procedures be compatible with those of RVIB, and several visits to Margaret Fialides, Head of the Tertiary Educational Section of RVIB, followed. RVIB offered to procure, modify and sell recording equipment to the Centre; to make its volunteer readers available for the production of text book material other than Deakin University publications, and to advise on copyright regulations. They also agreed to make the multiple cassette copies from the reel to reel master tapes produced by both themselves and by the Centre.

The production of raised models was another difficult area, and a solution was eventually reached in discussion with RVIB. Map and model masters were to be made by hand by the Centre's research assistants, using materials easily distinguishable by touch. These would then be thermally processed and copied on RVIB equipment. (See Part II: Equipment and Materials.)

In answer to the problem of adapting the many multiple choice exercises in *Imperialism: Expansion of Europe*, an electronic answer box was designed and built by the University's Electrical Engineering department, and the appropriate answer signals programmed in for the entire course. (See Part II: Equipment and Materials.)

C. Lloyd Junor's feasibility study was complete by March. He had examined the three originally proposed courses, two of which had been changed in the meanwhile, but his observations in general were none the less valid. He pointed to the need for consistency in setting out, recording and labelling the various parts of the courses; the need for glossaries of subject terms was mentioned several times; he also recommended culling and adapting certain parts of the material, although no details were offered. The report referred to special post and telegraph rates, to copyright regulations, to existing

advisory organisations and to possible funding bodies, all of which could be utilised by the University in providing courses for the blind. The most valuable part of the study however, was a comprehensive list of commercially available equipment, its cost and where it could be obtained. These covered learning devices for low-vision, blind and physically handicapped students.

This report was not immediately made available to the research assistants, who were by then well underway solving many of the technical and procedural problems he had analysed.

Six modified Akai tape recorders were ordered in May, but long before they arrived, it was becoming apparent that the planned second semester start would have to be delayed until the beginning of the following year. This would mean that where possible, students would be aiming to complete their courses in the same time span as non-disabled students.

The first two recording units were available by October, and recording began. One was installed at the studio at Gordon Technical College, and the other was used as a portable machine based at Deakin University. Gordon Technical College also made a technician available and in the early stages his advice proved invaluable. Readers had to be briefed in indexing and other procedures, and their recordings monitored. Some of the early work was technically poor, and some required extensive editing. However, the technical and pedagogical standard of the materials produced by the Centre was relatively high and the readers, personally involved in presenting their own work as clearly as possible concentrated on effective and efficient teaching procedures.

It had been intended that materials be tested in some way before they were made available to the students actually engaged in course work. With the starting date now delayed until 1981, an attempt was made to have the materials read and commented on by independent blind persons. Two such people from the Geelong area were contacted by the Dean of Educational Services to comment on the methods being used and on some of the materials. One of them commented in conversation with the Dean, and the other said that he had experienced no difficulty in listening to and understanding the tapes but that a blind student would probably need a dictionary of terminology and frequent contact with the tutor. The section on Statistics he found particularly difficult, and suggested that a totally blind student would really need a background in braille mathematics and a calculator with a braille or audio answering system. He also recommended that even totally blind students should have access to all the printed texts.

Although none of the students who eventually enrolled in *Introduction to Psychology* was totally blind, the issues raised by the trial readers were discussed by the Project staff, and, where relevant, incorporated into the operation of the Project. All print materials were sent out with the audiotapes, for instance.

Possibly nobody could have foreseen the problems and the delays intrinsic in the development stage, but information gathering, coordinating course team members and readers, and technical difficulties continued right through the recording and raised-model-making process. Both research assistants describe the 'presure of work', the 'problem of time' and the difficulties in getting the right people together to advise, make decisions or to coordinate the flow of activities.

The Pilot Project — 1981

Some enquiries from disabled students had been received by the University's Student Administration Unit during 1980. Most of them had not heard of the Project but had been attracted by the concept of Deakin's off campus program. Such enquiries were passed through the Operations Unit to the Centre staff, who contacted the enquirers by phone and talked to them about the Project. Three of these people, all of whom were blind, decided to take the courses modified by the Centre, and thus entered the pilot Project.

A reprint of the article mentioned earlier had appeared in *Quad Wrangle*[4] in April, and had prompted one physically disabled person to seek enrolment directly into the Project. A fifth new enrolment was received as late as January 1981.

Two further students who were already studying Deakin courses, had heard of the Project by word of mouth, and contacted the Centre for enrolment in one of the modified courses. Meanwhile proformas for disabled students sent out with the 1981 enrolment forms had been returned. Forty-four students completed the form, and of these, seven mentioned visual impairment and three multiple disability including low vision. It is interesting that as many as twenty-five recorded muscular or access disability, and were hoping for special consideration in writing examinations, rather than assistance with course materials. In March 1981 a letter was sent to all who filled in the form, informing them of the three courses which had been modified and inviting them to register their names with the Centre if they were interested in the pilot Project. Some had already started alternative courses, and were not interested in the subjects offered, but one more student joined the Project because of the letter.

By April 1981 there were eight. All were female, and three had been enrolled previously. Six lived in Melbourne, one at Bacchus Marsh and one on the south Victorian coast. Their ages ranged from twenty-two to seventy-six.

The range of disabilities they represented is best seen from Table 1 below. Several had multiple disability, and are listed under two or three categories. (See Part V: The Students, for details.)

---

[4] 'Open Uni For Quads', *Quad Wrangle*, Journal of the Australian Quadriplegic Association, vol. 3, no. 3, April 1980, pp. 43-5

Table 1: Types of Disability in Pilot Project

Totally blind since birth	1
Totally blind since adulthood	2
Vision restricted in adulthood	4
Muscular disability	3
Partial deafness	1
Periodic need for drugs	2

New students were permitted to enrol in only one course. This was in line with university regulations applying to off campus mature age students, allowing them to adapt more easily to the demands of returning to study than if they were to undertake a full study load immediately. One student who had been enrolled previously however, enrolled for two of the courses modified by the Centre, as well as a third non-modified second semester course. Another enrolled for one modified and one non-modified full year course.

Table 2: Course Enrolment in Pilot Project

Introduction to Psychology	3
Images of Man	3
Imperialism	3
Other courses	2

One of the first lessons the Centre personnel had to learn was just how different the problems and needs of eight individuals could be. (Refer to Part V: The Students.)

The two research assistants worked throughout the Christmas break to finish preparing the courses for the Project's first students. Once the students had been identified, their specific needs became clearer and the type of materials necessary could be tailored more finely. The thermoform tables and diagrams for *Introduction to Psychology* for instance took on a low priority because there were no totally blind students doing this course. Organising access and building ramp at the Vines Road campus on the other hand took precedence over other matters because of the student in a wheelchair.

New enrollees found they had the same kind of returning-to-study problems as any other mature age entry student, and counselling was needed. An attempt was made to edit and record the University's pre-course *Counselling Package*, but it was eventually sent only to the three *Imperialism* students while the others received the regular printed version.

The staff established regular contact with all students, both by phone and by visiting them in their homes. They helped to solve technical and organisational problems, liaised with tutors and course teams and with the University's counselling service personnel. Reference books needed for assignments had to be found and extra recording organised with RVIB. Problems

with indexing and the inadvertent use of alternative editions by the readers continued to plague the research assistants. Where students were not coping with health or personal problems, they were referred by the research assistants to the appropriate welfare organisations. Transport problems were looked into and solved. Copyright regulations, in a state of flux with the new laws in 1981, had to be tracked down, read and understood by the staff. And when it became apparent that the Project was working and that at least some of the students were able to continue, work began on preparing the second half of each course for the second semester.

Five students in fact survived the first semester. The first 'withdrawal' had occurred early in the life of the Project when one student was found not to have completed her enrolment forms in time, in spite of reminders from the Centre and from Student Administration. Two other students began to get behind with their work, and it was first arranged that they be allowed to extend their first semester work over the whole year. One evetually withdrew formally, more because of 'lack of readiness' than anything else, while the other died. Only one of the three can officially be classified as a withdrawee, and none of them related their failure to complete the course to the treatment or presentation of materials, or to the competence of the Centre's staff.

In March the operation and organisation of the Project became the joint responsibility of the Dean of Educational Services and the Head of University Community Services (UCS). The financial and policy functions remained the province of the Dean. The research assistants began to meet regularly with the Head of UCS and report directly to him. He advised on the Centre's activities when necessary and liaised on financial and policy issues between the Dean and the research assistants.

The research assistants both spoke of frustrations caused by delays in getting things done throughout this period. They were still employed by the Centre for fifteen hours a week each, and the short hours were found to be disruptive and interfered with the flow of activity and decision making. They were becoming aware, moreover, of their lack of authority to make decisions, or to hurry others into doing so. Course team members were not always available to advise on or to read their own material, and alternatives were not easy to find. The policy from the beginning had been to make use of voluntary assistance wherever possible, and finding this was often time consuming and frustrating. While they were able to use University services such as transport, telephone, stationery and secretarial support, decisions on funding for special equipment or services had to be referred to the Dean through the Head of UCS. This tended to fragment the decision making process, and create delays.

Part 2
Equipment and Materials

Transforming Print Material

All Deakin University produced course material was recorded on reel to reel audiotape masters. This included Study Guides, Workbooks and some of the Readings. They were read whenever possible by the course writers, or by volunteer readers from the University staff. In most cases the textual material was read as it appeared in the books, with the occasional modification of a word or phrase to cater for non sighted students. Expressions referring to 'looking' and 'seeing' for instance, were rephrased as 'referring' or 'listening to' without changing their meaning. This was considered to be more tactful to sight impaired students who are constantly subjected to the presumptions of a sighted culture.

Modification of self testers and exercises demanded more thought and attention. Multiple choice questions for instance, required the sort of instant feedback which sighted students had, just by turning the page or looking elsewhere for the printed answers. Exercises requiring tables to be completed, or maps or diagrams to be read and interpreted, needed reformulation into non visual form. Some of these could be read on audiotape, but others needed extensive restructuring to enable the student to cope with the volume of information to be handled at one time. Pictures, included for variety in the printed text were not automatically omitted. Sometimes individual pictures or cartoons were described briefly, or several collated into a unified description. Where the pictorial message was considered important to the context, descriptons had to be skillfully worded. In all cases, care had to be taken that the low vision student had access to the whole course, and that concepts were not omitted or oversimplified merely because they were visually complex or too much of a challenge to the modifiers.

At first methods of restructuring and reformulating the exercises were worked out in fine detail by the research assistants and course team members, but with practice, methods became easier and faster. The better his teaching skills, the more readily the course team member learnt to adapt the pedagogical instruments needed to meet the new mode.

Reference books, prescribed texts and most of the Readers were read on tape by RVIB voluntary readers. Here there were no pedagogical decisions or adaptions to be made, and the books were recorded as part of the RVIB

Tertiary Education project and were covered by their copyright. Some of the books were highly specialised and intellectually demanding and considerable strain was put on the volunteer readers.

Reel to reel masters produced by both the University and RVIB were then copied onto cassette tapes in multiples of six for distribution to the students. RVIB uses specially calibrated high speed equipment which records all four tracks simultaneously in nine minutes.

Recording and Indexing

On the advice of RVIB, recording equipment and the system of using it was made compatible with the Library of Congress Talking Book standard developed in the USA. The Akai reel to reel machines for making masters and the GE portable cassette machines used by the Centre and its student were ordered from the USA through the RVIB. RVIB technicians converted them to Australian voltage via a transformer.

The Akai has three major modifications distinguishing it from a normal four track reel to reel stereo recorder. First, it is essentially a mono recorder. It records on four separated tracks at a standard 3¾ ips. Another modification makes provision for precision monitoring, allowing for tight and relatively noise free editing and correcting. And third, it has a digital controlled audio indexing device, whereby easily identifiable tonal signals can be used to mark the beginnings of pages and chapters. A single signal denotes a new page and a double one a new chapter. The tonal signal is recorded subsonically and can only be heard when using the Fastforward or Rewind button. This enables the blind student to find a page or chapter quickly by counting the page or chapter signals at high speed. The signal is recorded automatically on the master tape by pressing a switch—to the right for a single tone or to the left for a double—and should not interfere with the reading or listening process.

Six Akai recorders were ordered by the Centre in May 1980. Two arrived in October and two more early in 1981. Two still had not arrived by the time this report was being written in September 1981.

The GE portable cassette recorders were recommended for student use. These were also modified according to the Library of Congress Talking Book standard, and were meant to be used in conjunction with the reel to reel system described above. The GEs included a record and playback head designed to allow for the separation of all four tracks. They play at 15/16 ips, or half normal cassette speed, but can also be used for playing conventional tapes by adjusting a switch. They are sensitive to the subsonic audio indexing tones described above when used at fast speed. A speed regulator was built in so that a student can replay less demanding material at a faster speed, or slow it right down to listen to more complex arguments, or new words and phrases difficult to hear.

Eighteen modified cassette recorders were ordered through RVIB, and most of these have been distributed to the students. Several are kept in the Centre as spares, or for use in monitoring or testing tapes.

Raised Models

Maps, diagrams and graphs were built and glued onto special heat resistant paper using a variety of easily available materials such as string, wire, sand paper, small beads and cardboard. They were labelled in braille where necessary. These are the model masters, made by the research assistants at the Centre and sent to RVIB for reproduction on the Thermoform duplicator. A page sized plastic sheet is heated in the Thermoform duplicator and pressed against the master, where it is sucked under pressure into the contours of the original. When cooled, it hardens into a raised model which can be read by touch by the student.

There are limits to the amount of detail which can be included on a raised model, and some very complex maps pose presentation problems. Where detail must be omitted the raised models are accompanied by word descriptions, or by an additional labelling system.

Four sets of commercially packaged plastic map making materials were purchased from the UK. These expanded the number of symbols and motifs which could be used on the master copies, but to the date of writing, no better method has been devised to replace the original slow process of making the masters.

Self-work/Note-taker Tapes

A method of note taking appeared necessary if blind students were to study on an equal footing with sighted students. This would be particularly important when students were preparing for assignments or for exams, or when a difficult passage or section of work was being studied. Furthermore, the modified self testers and exercises in the Study Guides sometimes required a method whereby students could record their answers and mark them against those given later. In the same way as sighted students need to learn and develop note taking skills, so low vision students need to develop some kind of corresponding skills to help them in this way.

Centre staff therefore encouraged students to use audiotaped notes in the same way as others use written notes. Blind and low vision students were advised to keep blank tapes on hand, and to try to take notes or use them to help their memory of facts or arguments. Study Guide instructions such as 'Circle the correct answer' were adapted to 'Record the correct answer on your self-work tape', to encourage students to use them as self testers or answer tapes. The idea was not developed in depth, but it was hoped that students using their own methods would open the way to refining it as a learning method at a later date.

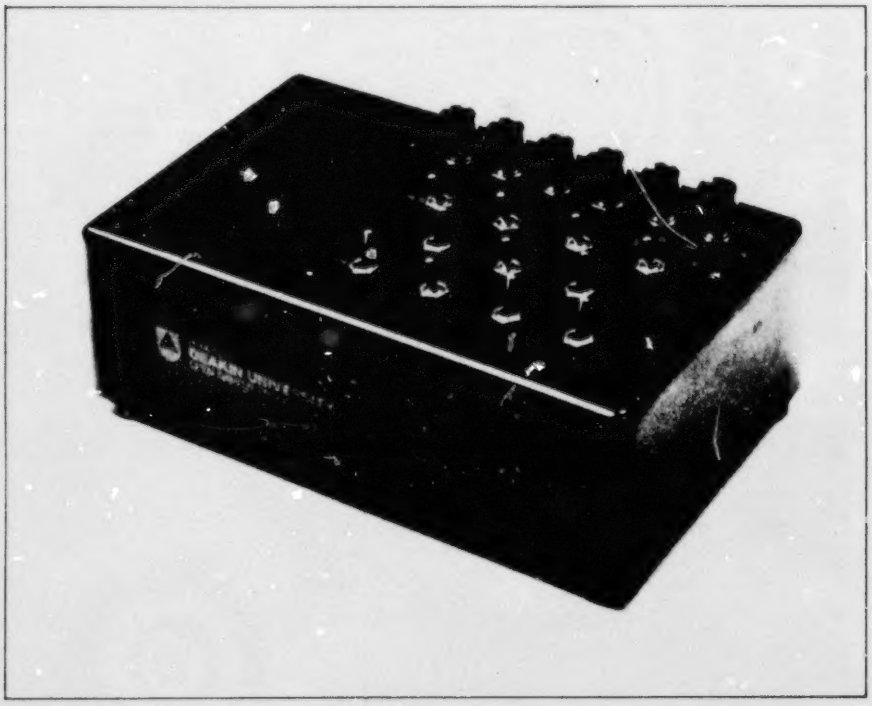
Large Type Electric Typewriters

Three Adler electric typewriters with pitch 5 type were bought by the Centre in March this year. These were to be lent to students with low vision who wished to type their assignments and to read their work when it was done. Two of these were used by students in the first semester. The other is used in the Centre when large type correspondence is necessary.

Multiple Choice Answer Box

The answer box is an electronically wired device designed and built by the University's Electrical Engineering section.

Figure 1: The Multiple Choice Answer Box



It enables answers to up to fifteen sets of fifteen questions to be programmed in simultaneously, so that when the student presses the right answer button to the right question, it confirms the answer with a tonal signal. The wrong answer button gives a different signal.

The prototype was trialled on the first semester course in *Imperialism* and all the answers to all the multiple choice questions were contained in one programmed box. A more sophisticated and easily operated model was then built, and has been programmed for the second semester *Imperialism* course.

Costs

The following is a detailed breakdown of the cost of materials and equipment. It does not include salaries or routine running expenses. The bulk expenditure has been on tape recorders, tapes and typewriters. The reel to reel tape recorders used for making master tapes are not recurring expenditure, but further expenditure on portable cassette recorders, tapes and typewriters will depend on the number of students in the Project at any one time Tapes will continue to be needed as long as new courses are being modified.

Date of ordering	Item	Cost
1.5.80	6 Akai tape recorders	1683.00
29.5.80	Map Making kits	48.00
14.7.80	Wheel, tools, primer etc.	61.43
22.7.80	5 geometry mats	16.00
26.9.80	50 x 7" reel to reel tapes	500.00
13.10.80	6 GE recorders and transformers	842.28
12.11.80	Aluminium foil and Braillon	32.48
4.12.80	10 GE recorders and transformers	1403.80
9.1.81	Scotch Braille labeller	32.00
18.2.81	Tape cassette filing drawers	180.00
19.3.81	3 large type Adler typewriters	960.00
19.3.81	2 GE recorders and transformers	314.00
30.4.81	200 low noise cassettes	390.00
30.4.81	100 reel to reel 7" tapes	894.00
30.4.81	Books	65.45
15.6.81	Subscription, catalogue etc.	22.00
	TOTAL	7444.44

Planned Developments

Funding is currently being sought by educational consultant C. Lloyd Junor, for two projects relevant to the Project. He proposes to develop a method of refining the way raised models are presently being made. He is experimenting with the production of embossed drawings, graphs and charts on treated aluminium foil. These could be included with the teaching materials, or used as master sheets to make thermoform copies. The second project involves the development of a more efficient method of audio indexing than is currently available. He hopes to be able to develop a method of subsonically recording a verbal index, audible only at fast speed, and eliminate the need for counting tone signals to find pages and chapters. He demonstrated a prototype at Deakin University in November 1980.

Part 3
The Project in Operation

The five students who completed the first semester were interviewed first by telephone and again in their homes. The home interviews were tape recorded. The withdrawee and the one who failed to enrol were interviewed by telephone, while the other was too ill for the researcher to talk to.

Table 3: The Students—First Semester 1981

	Completed	Not Completed	Total
Previously enrolled	2	1	3
New enrolments	3	2	5
Total	5	3	8

Two of the successful students had undertaken Deakin University courses previously and three were new enrollees. Of those who did not complete the first semester, one had been enrolled previously and two were new enrolments. The issues dealt with in this section are based on the comments of the five successful students with reference to the other two wherever applicable.

*Table 4: Course Results—First Semester 1981**

	Successful Students			Unsuccessful Students	Total
	D	C	P		
Introduction to Psychology	1		1	1	3
Images of Man	2	1			3
Imperialism		1		2	3
Other subjects		1			1

* In each case this represented a half year's work. Except for *Introduction to Psychology*, a result was given on the first semester's work, and credit units were awarded. The *Introduction to Psychology* results given here are based on the cumulative results up to that time. Results are graded Distinction (D), Credit (C) and Pass (P).

Value of the Project

Comment on the Project as a worthwhile enterprise was enthusiastic. 'I think the Project is really valuable'; 'I feel that everything I need has been done for me'; 'I love it . . . I've always wanted to study and I like to do things on my own if I possibly can'; 'I became used to nothing happening . . . Suddenly it's all moving for me . . . It's exciting'; 'It is certainly a very ambitious project and very worthwhile.' One of the unsuccessful students concurred. 'It is a terrific idea really.'

Two of the new enrollees are totally blind, and they were both very conscious that without the Project they would not have been able to study university level courses at all. 'It has enabled me to open my mind,' one of them said, and the other added, 'I'm reading things I'd never have been able to read since I lost my sight . . . I'm most grateful.'

The two partially sighted students who had studied successfully prior to the introduction of the Project were positive about the difference it had made.

> I find I'm getting so much more out of my study now. My reading was so fragmented, I was only covering a very narrow area in my previous courses, concentrating just on the assignment topics. With the tapes I can learn much much more.
>
> It really boosts your confidence. I can't read across the line normally . . . Using the tapes takes the strain out of studying.

One student spoke of her study as 'a double exercise' in personal development. 'It has given me the opportunity to improve in logical thinking. My neuro-surgeon was delighted with my progress.' Another said, 'My family said I didn't have a fine enough mind to study. This is proving to myself and to others that I can do it.' The youngest student (22 years) saw the way opening towards useful employment for the first time since her illness crippled her. 'I wanted to do primary teaching,' she said, ' . . . perhaps this is the way I'll be able to do it.'

All five successful students are anxious to continue studying now they have started, and they are all aiming to complete a degree. The new enrollees are less definite about planning their areas of concentration but the two totally blind students are resigned to having to follow the courses as they are transferred on to audiotape. 'The Project must go on. I couldn't possibly cope if I didn't have the tapes,' stated one.

The two partially sighted students are more impatient. One of them said,

> I would rather study this way but I want to get through the degree as quickly as I can. I don't know whether I'll be able to wait for the subjects to be put on tape. I imagine it will become more important to have the tapes as the subjects become more advanced.

One student put in a special plea for continuation.

> Disabled people have become personalities this year with the International Year of Disabled Persons, but something like this once started must be

able to see us through. Giving false hope is worse than not giving us a start at all.

In the minds of the participating students the Project and its continuation has rapidly become a fact of life. They can no longer imagine being without it. It is seen not only as a means of personal progress but as a public service.

> People expect you to stay at home and not contribute anything to society – not to give back. It's all wrong. and this sort of project shows us how to overcome that.
>
> I would like to see this as a resource available to the community. I'm sure there'd be many, many more who would use it as it becomes more widely available.
>
> I'd like to prove that if I can do it, others will be encouraged to do it too. Physical disability doesn't mean that the mind is barren . . . Why shouldn't these courses be done by all those people in hospitals and paraplegic wards . . . Their minds are starving.

Student comments keep coming back to the resources of the Project as making it all possible.

> I think that any visually handicapped person who wants to do a university course with the aids now being made available, can do it.
>
> I feel that, except for a few little problems, I am studying more or less on an equal footing with a sighted person.
>
> Perhaps I am a lot better off than the ordinary on campus student, because I can play all the material over and over again . . . They have to rely on their notes.

Equipment and Materials

Initially each of the visually handicapped students were provided with two modified tape recorders. This was to enable them to refer to two tapes at the same time. The Study Guides and Readers are normally written to complement each other, and the student is often required to refer to both simultaneously, or to cross reference with sections of a text. At other times the student may have to use the self work tape for answering questions or exercises in the Study Guide. The use of two tape recorders enabled the students to move from tape to tape without reloading. At worst a student may have to use a Study Guide, a Reader, a text and a self work tape more or less simultaneously. This could mean the necessity for changing both tape and track for each reference. One student referred to 'constantly juggling the tapes'. One claimed to have erased part of a text by accidently depressing the Record button. The student who withdrew also had trouble loading tapes, and claimed to have broken two of them. Another spoke of 'a fear of inadvertently recording on the wrong tape.'

The student with the greatest technical difficulty had very little strength in her fingers and was eventually provided with a third machine specially

adapted with a lever attachment to help her operate it more easily. One blind student asked if it would be possible to have access to more tape recorders, but in fact was managing as well as the other students with those she had.

It is worth remembering that women over forty-five years of age are known to be the least technically competent group in Western society[5], and three of the students fit into this category. However, with practice and patience the earlier technical difficulties reported seemed to have been overcome. 'Anyone can do anything if they have to,' commented one, referring to the power of motivation in acquiring new skills.

Technical problems in some cases appeared to overlap with organisational ones. Someone reported initial difficulties in trying to find the right tapes at the right time. One course had as many as eighteen ninety minute, four-track tapes, plus fourteen tapes which were part of the course before modification. The sheer amount of material may have overwhelmed new students especially. The student who withdrew commented that she 'rushed into things . . . impatient of everything . . . getting the tapes all muddled up . . . '

Another complication arose from the necessity of using different people to record various parts of a course. Because of the lead time needed to have tapes copied, and the pressure to send them out to students on time, blocks of work were sometimes recorded separately on one or two tracks of a tape, and never edited in with the rest of the readings. This meant that more tapes than necessary were used, and that as much as a third were blank. One course was sent out in weekly units, each unit on a single tape, in line with the way the print material was distributed to sighted students. This also meant blank tracks and a larger number of tapes than necessary.

Tapes were labelled in words and in braille. One student could read braille, but both she and the other totally blind student confessed to using a supplementary labelling system on the tape boxes and of developing their own method of finding things. The two experienced students did not appear to find the technical or organisational aspects of studying this way as much trouble as the new entry students.

Several students mentioned the audio-index system. 'The index system is a bit laborious,' said one, and ' . . . could be better', according to another. One of them mentioned the possibility of a different signal tone to indicate subheadings on a page so that points on a page could be referred to without listening to the whole page. One said, 'Perhaps a double tone signal could be given at the beginning of each article rather than at the beginning of the page in the Reader.' The indications appear to be that the indexing system could be refined.

Apparently some of the texts were not indexed at all, and this made 'finding page references a bit difficult.' Related to indexing was the issue of 'scan-

---

[5] See for instance: Jones, R. W., 'Applications and limitations of radio and schools' in Baggaley *et al* (eds), *Aspects of Educational Technology*, vol 8, Pitman, 1975, p.36

ning'. One student in particular asked if it would be possible to develop some system of previewing or abstracting an article so that a blind student could get some idea of its length, topic and level of difficulty before listening to it. 'You're afraid to skip bits of the readings in case they're important,' she said, 'but some of them turn out to be fairly superfluous.' Another student said almost the same thing, adding that, 'Perhaps in the history courses there could be more pruning . . . Some of the readings are long and boring and merely repeating what was already been said.' Another stated that she would not like to see any cutting done. 'You can't cut and skim . . . I want to learn it all.' This particular student, however, did very little else but study, and claimed she listened to all her tapes three or four times.

The people reading the various tapes came in for some criticism.

> I find it hard to hear certain kinds of voices anyhow, but some of them have dreadful voices.
>
> A boring tone of voice makes a lot of difference . . . I didn't get as much out of one section of the course because the reader was shocking . . . The reader was bored out of her mind.
>
> You switch off mentally if it's dull. You find you've got to have a break and go on to something else.

Only one student felt she could detach herself completely from the way the tape was read, and she was an experienced student.

> If the reader had a voice like Richard Burton, you'd be distracted just listening to his voice.

One person stated categorically that men's voices were 'better' than women's, although she was not necessarily a representative case because she suffered from a hearing disability.

The criticism did not extend to the Study Guides, however, which were thought to be 'very good'.

> There's quite a lot of difference between the Study Guides and the texts. When the course writers are reading their own work, they seem to modify it as they go to make it easier to listen to.

It was also suggested that the self testers and exercises might be recorded on a separate tape, so that they could be listened to before the relevant section of the Study Guide.

> It is very difficult to be checking back for answers from the Guide when the questions are on the same tape. I always record them separately first, so I can be listening for the answers as I go through the unit.

New vocabulary was dealt with in different ways by the readers. It was up to the individual reader whether they spelled new names and unusual words as they appeared in the text. 'The more intelligent readers are the best', someone commented.

> I would like the German and foreign words spelt. It is very difficult to identify names and places and titles of books . . . when you just listen to them. And they are sometimes pronounced badly as well.

A totally blind student brought up the problem of vocabulary generally. Even if she had had access to a computer or a braille dictionary she said, it would not mean that specialist terminology would be included. She asked if it would be possible to consider setting up some sort of library service whereby the spelling and meaning of specialist words could be requested when they arose.

> It takes me up to a fortnight to have a friend do this for me, and by that time I've more or less guessed the meaning from the context.

Only one of the successful students was using raised models with her course, and she was partially sighted. She said she found them hard to use, claiming to be ' . . . not very good with maps anyhow.' 'I can understand how they would be a help for the completely blind though,' she added.

The same student was also the only one still using the multiple choice answer box. 'It is excellent,' she said, ' . . . a real confidence booster to be able to check your answers immediately . . . A superb idea.'

The skill of note taking on tape was proving beyond most students. One partially sighted student had developed a system of single word 'memory joggers', whereby a single word cue was used to remind her of a whole segment. A blind student said she could not use the self work tape, either for note taking or for answering the exercises.

> I just listen to the questions and try to answer them mentally. When I'm doing an assignment I rely on my memory. I just get up in the morning and speak my essay onto tape. It makes me very nervous. I can't edit it . . . I can't change it at all once its on tape . . .

The other totally blind student suggested that:

> The note taking system could do with some developmental expertise from your resource people . . . If a structured learning method could be evolved, it would be so valuable.

The withdrawee claimed to have been particularly distressed by her inability to use the note taker tape.

> I would try to get an outline of what I wanted to say, but then I couldn't do the filling in. I just couldn't get the skill.

A partially blind student commented on how helpful it was to have had the printed course books supplied as well as the tapes. She claimed that to save time she would occasionally get her husband to check references for her, or look up some point she needed to use. 'It takes so much longer to try to find everything on the tape.' A totally blind student who had very little support in the home, however, asked if everything connected with the course could be included on tape.

> My envelopes never get opened. I was waiting and waiting for my assignment questions when someone mentioned they could be in the printed Course Guide. Then I had to find someone to read it to me . . . These things should be on the tape.

Study Skills and Needs

New enrollees in the Project experienced the same kind of problems which mature age entry students generally must face. Two of the unsuccessful students admitted to not being emotionally ready for tertiary level study. 'I lacked the discipline . . . I didn't have the right skills or the patience to learn them quickly enough', commented one. 'There were just too many prolems', said the other. 'Next time I'll really have to prepare myself.' All three of the new students who survived the first semester had done HSC or other course work within a year of starting with the project, but all admitted to the new kind of emotional and organisational demands university level study made on them. 'I realised I had few study skills, so I borrowed *How to Read* and *How to Write* recorded short courses from RVIB,' said one. The same student spoke of the problem of ' . . . knowing how to be selective when you're a new student.'

One student spoke of working by a system of self contracting.

> I get everything organised in the mornings . . . set goals for myself and write down what I intend to do for the day. Then I work through the afternoon for three to four hours . . . taking ten minute breaks when I need them.

One of the experienced students also spoke of making personal contracts, but confessed to being frequently interrupted by visitors and people coming to stay. When she was able to work without interruption she claimed to work solidly for about five hours at a stretch, and then to contine listening to the 'less important' tapes while she prepared a meal or did her chores. She said she had kept up with the work (of her two simultaneous courses) but commented that the *Imperialism* workload was very heavy. A third said she tried to spend two and a half to three hours a day, excluding Sunday, on her one course, and took 'the odd day off work to catch up' when she felt she was getting behind. She said she normally listened to each tape once.

> I'd love to have more time, but I can't afford it becuase of the amount of work I have to get through in my day. But I have to get through it all, and I think it heightens your perception when you have to work under pressure.

These three students are not doubly handicapped by sickness over and above their disability, and their work patterns have been evolved to suit their own ability and style, more or less as any non-disabled off campus student would find. The other two however are frequently ill, or on drugs which interfere with the way they work.

> I study some time every day . . . it is different each day . . . some days I'm quite sick and find I can't do so much.

> I study day and night—whenever I can . . . except when it is too cold . . . I have to play everything about three times.

The latter can do nothing for herself around the house, and her study appears to have filled her entire waking day. The former does some work around the house but her mother lives with her and looks after her.

The question of support arose in several different contexts. All the successful students were managing the requirements of the course more or less to their own satisfaction, but relied in varying degrees on help from the people around them.

Some other person will occasionally be needed to read notices and letters from the University, to check spelling and typing in assignment papers, to act as 'a case study' for an exercise, as for instance required by the *Introduction to Psychology* course, or merely to take an intelligent interest in a topic the student is involved in. Three of the successful students are married but only one of them is able to find full support from her husband. This student also has a son who has recently finished a degree and he takes a supportive interest in her work. The husband of one of the married students is also blind, and while she claims to have his interest and emotional support, she feels she relies a lot on 'the secretary at work' who will read letters and notices and check assignments for her. 'Most blind people will have a neighbour or someone who will help them like that,' she said, but she possibly does not realise that the situation tends to be a little different for those who became blind later in life. The third married student in fact gets very little support at all from her immediate family. She has learned to cope with the organisation and practical detail of her study by herself, but for emotional support she will discuss her work with her doctor, the visiting nurse, the housekeeper or with anyone who will listen to her on the phone. She shows every symptom of social and emotional isolation. She of all the students has made most use of phone contact with her tutors and with other students and has a very apparent need for regular contact with the Centre.

Most of the other students have tried at least once to contact a tutor about their work, and their comments sound much like those of other distance students not in the Project!

> At times I've tried to ring, but nobody was in the office. I guess my questions were just not important enough to go on trying.
>
> I don't think phone contact is a great deal of help really . . . by the time I've formulated the question, I've usually got the answer.
>
> I rang one tutor several times, but he didn't ring back, so I gave up.

However, support from the Centre's research assistants was quite a different matter. They rang all the students regularly and the students were, without exception, more likely to discuss anything that was worrying them on these occasions. 'If I think of something someone at the University should know about, I go through J . . . She sort of liaises for me.' They tended to regard the research assistants as friends, filling the need for both counselling and support.

Three of the students attended Weekend Schools. The student in the wheelchair was driven regularly to tutorials, and had more on campus contact than any of the others. She feels the experience has been stimulating and personally satisfying. This was supported by another who attended Weekend Schools.

> Going there gives you a sense of stability. It makes you feel more secure when you know that others have the same problems as you do.

The concept of a group help scheme had been mentioned to the students by the Centre staff, but with such a small group and with such differing needs amongst them, it is not surprising that it has not become a major thing. One student mentioned ' . . . long talks on existentialism with K . . . ,' but claimed it was not so much a matter of sharing ideas as 'a point of social contact.' Several students also spoke of phone contact with students outside the Project.

On the question of telephone contact, one student suggested the possibility of recording conversations with tutors or with other students, especially those related to course work.

> It's hard to remember anything your tutor says, and a blind person can't very easily take notes. You could have your tape recorder next to the phone and repeat everything he says . . . or perhaps some sort of recording device could be attached to the phone.

Three of the students did an examination at the end of the first semester, and each had one of the research assistants supervise her at home. *Introduction to Psychology* had a mid course objective multiple choice type exam paper and neither of the students needed extra time for doing this. The other student was supervised at home for a three hour written examination on *Australian City*, a course she had done without the help of the Centre. She had been especially provided with dark lined paper to help keep her writing straight, but needed no extra time or other privileges. Special consideration in examination conditions is one of the special services the Centre offers to disabled students, but one partially sighted student spoke about it with some embarrassment.

> I don't know about putting J . . . to all that worry . . . bringing her all the way up here. I have been wondering whether I should try to do future exams just like any other student.

It should be borne in mind that some disabled students may wish to test themselves this way, although every case will have to be judged individually. This particular student in fact is prone to 'sick days', and was ill on the day of the exam she took in June.

Support for the student in the wheelchair has followed a different pattern throughout. She was attending tutorials regularly at the Vines Road campus, and the Centre was instrumental in having a ramp built to give her easier access. 'The new ramp is fabulous,' she said, but she expressed fears that she might 'cause more problems' if she finds on campus accommodation next year. 'I can't manoeuvre my chair around those beams in the Vines Road library,' she said, 'and I'm told they can't be moved because they support the roof.'

Part 4
Discussion and Recommendations

The Project

It is not difficult to recommend that the Project continue. This report in itself is an indication that the scheme can work, and that it is doing what it set out to do. Two of the students are totally reliant on the taped materials if they wish to continue studying. Two others were adamant about the positive value of the tapes having worked with the modified materials and without them. The Project has opened the door to a whole new life for the student in the wheelchair. All five wish to complete their degrees, and should the support of the Centre be withdrawn for any reason, they would experience a great loss.

Some curriculum development expertise should be given to the choice and structure of programs as the Project expands. The first three courses were chosen because they were popular first year options with general program access. Each gives access to a degree program in Education, Humanities and Social Sciences, according to how the student builds his/her course sequence into the second and third levels. It is logical that access to the three programs be kept as open as possible, and that disabled students have as much flexibility in developing their specialisms as any other student. Eventually the Sciences, also, will have to be included. Some courses, however, will be more difficult to reproduce non visually than others, and the rate of course modification will always be tied to the number of staff and the funding of the Centre. It is recommended therefore, that a long term overall plan of program development be designed and implemented in selecting future courses.

There can be little doubt that the Project must expand. The expenditure in time and effort in adapting and taping a course is many times greater than in copying and disseminating it. Furthermore, the existence of a market has been proven. Eight people were found to participate in the pilot program, and several enquiries regarding new enrolment next year have been received. Two further courses will be ready for 1982[6], and the needs of all known students at present will be catered for by the five completed courses. The Project has not yet been advertised and expansion plans for 1982 are modest. With the idea in mind for a more rapid expansion in 1983, however, two further courses are already in the early planning stages[7]. It is hoped that

---

[6] *Life in Words* and *War and Modern Industrial Society*

[7] *Symbols and Society* and *Australian Cities*

during 1982 the Centre will launch a two pronged publicity drive, to advertise the Project to potential students and to enter into discussions with other interested institutions.

Materials

The modified materials are apparently satisfactorily filling the needs of the students enrolled in the project at present. There is however, always room for improvement of old techniques and the development of new ones. Each new set of students will have new needs and even when a certain technique has proved successful in several cases, it may not necessarily be satisfactory for a student with a different disability and different needs. The Centre's staff must be constantly aware of the need for changing and adapting approaches and presentation techniques. For this reason, it is recommended that a written record of student feedback and materials evaluation be compiled at least once a year, and the results cumulatively filed for future reference. For the same reasons, a degree of staff continuity is also strongly recommended.

Some of the issues raised by this survey deserve some further thought, now that the basic problems have been solved and the research assistants have become more confident in the techniques of modification. It is suggested that each of the following issues be discussed by the Centre's staff and other interested parties and that clear policy directions be sought. An experienced course developer could also be consulted.

Preliminary work has been done in the Centre on compiling a set of directives for Study Guide readers. This should be regarded as a high priority in the light of student comments on spelling new or foreign words, the need for subject glossaries, scanning or abstracting articles in advance, signalling and referencing of subheadings. It should also include methods of adapting exercises and self testers, advice on when to use the multiple choice box, when to read a table or map and when to recommend a raised model, how and when to refer to pictorial material, and when to delete or change the text. Instructions on using the audio index system, introducing and labelling the tape correctly and other organisational techniques developed through experience by the Centre should be given as well. Such a set of directions would give the Centre for facility to train readers when course writers were not available to read their own work, and build up a pool of tried and tested teaching and organisational techniques.

The use of volunteer readers has led to two problems. In the early stages of the Project, audio indexing was not always done properly, which proved frustrating and time consuming for students with heavy workloads. Second, the choice of reader has not always been appropriate to the standard of the book being read, and students have had a greater concentration strain put on them. RVIB cannot be blamed for this. Their volunteer readers undergo a training session and are equipped with detailed instructions on how to organise the recordings. Every effort has been made to match the interests of the readers to the subject being read. They claim to have used their 'best' volunteer readers for Deakin University readings, and they have made a point

of rerecording if they were not satisfied. The final responsibility for standards, however, must fall on the Centre personnel and the onus is on them to monitor all new material to see that it has been completed satisfactorily. Lead time must be planned to allow for unexpected delays. It is further recommended that research be initiated by CES into the question of the effectiveness of different kinds of reading voices in the learning process.

Methods of improving the labelling and organisation of taped materials might be borne in mind by Centre staff. As the number of courses, and the number of students studying more than one course at a time increases, a clear organisational system will become essential.

Editing the course tapes so that the various sections fit together even when read by different people, is also related to lead time planning. With recent changes in Deakin University's Media Unit, and access to producers and technicians now assured, this problem should be easily overcome.

The use of drama, music, contrasting voices and sound effects used in the early *Imperialism* tapes, was largely discontinued because of the demands it put on the course teams. Again, the advice and assistance of the Media Unit could be sought when the use of such techniques was considered desirable. However, no feedback on the effectiveness of these methods is available, and research appears necessary to ascertain whether the techniques are worth the time and energy. CES could be approached to consider such a study.

The pedagogical and logistical implications of recording self testers on separate tape as one student suggested, needs further discussion. It may be better to leave them at the end of the units as they are, and that students be advised to work out their own best methods of using them.

It has been demonstrated how important it is that the course team writers and RVIB readers use the same edition of a text book. Now the research assistants are aware of this problem, it falls on them to liaise closely between writers and the RVIB, and in plenty of time to ensure that this be done. Similarly, course teams must be encouraged to keep the Centre fully informed of alterations in their courses and of proposals for rewriting or reshaping them from year to year.

Although nearly one hundred raised models were made for the first semester alone, their effectiveness was not tested to any real extent in the pilot Project. If these were used next year, it is essential that feedback be collected and their use monitored. This will be particularly important should Lloyd Junor's new model making process be available in the near future.

Student Problems

Initiative has been required of the research assistants in handling student problems as they arise. However, the experiences of the first semester indicate that a number of basic problems will be common to most of the students entering the Project and that these can be anticipated.

It is recommended therefore that attention be given to compiling a precourse counselling package especially for disabled students. This should be audio recorded, and could include the main features of the UCS package with advice on the problems of returning to matrue age study, of organising time and study routines and of the need for self discipline. It could include the principles of selfcontracting, motivation and emotional readiness. For disabled students in the Project, however, more attention could be given to the issues of support - spouse, family and friends - of self help groups and the availability of tutors and lecturers for telephone contact. It could deal with organising study patterns from the point of view of students who are frequently sick, or in pain, or the recently blind who need to develop their listening skills. Reference to the RVIB tapes on *How to Write* and *How to Read* could be made, and possibly new ones developed. The recently blind also need guidance on methods of doing their assignments, and those who cannot write or type have to develop the considerable skill of speaking their whole assignment straight onto tape without editing. Memory development is more important for blind or low vision students and some directional exercises could be devised to help them in this way.

Attendance at tutorials and Weekend Schools presents additional problems to the disabled, and as evidence is accumulating of the effectiveness of such activities in the learning situation, every effort should be made to anticipate and overcome these problems in advance.

The counselling package should be concerned also with technical issues such as the use of tapes and tape recorders and could well include a detailed training course in the skills required. Several of the students experienced serious technical difficulties initially, and it has to be remembered that something like a broken tape is not only time consuming but demoralising as well. Another technical issue which could be included is the desirability of recording telephone conversations. This could be done on a portable tape recorder by the telephone, or in some extreme cases, Telecom might be approached to install a telephone microphone.

There is a real need for development in the area of note taking skills. Only one of the students admitted to making any progress at all in the regard, and she presumably had established a basic skill level as a blind child at school. This is a difficult area as even sighted students develop highly personalised systems of note taking and the connotations for blind people are even more complex. Perhaps initially some examples and exercises on how the note taker tapes might be used with different kinds of text, could be included in the precourse counselling package. But in the longer term this appears to be an area requiring formal research, either by UCS or by the School of Education.

Most of the students managed well enough with two tape recorders, and some can afford to buy a third or a fourth for themselves if they wish. The Centre, however, must continue to examine each case on its merits and be prepared to supply extra tape recorders in special circumstances, in spite of the cost involved. Some of the technical difficulties arose because the GE portables are recorders as well as players. While students need one machine for recording their self work or notes, all other machines need be for playing

only. Tape players are cheaper than recorders, and consideration could be given to this when further machines are being purchased.

It is important that all material related to a course be available on audiotape. Adaptation of courses to nonvisual forms must include every part of the course — the preliminary Course Guide, notes to the student and supplementary materials. This would preclude the possibility of a student worrying about the nonarrival of an assignment topic, which occurred in the case of the student who had no-one to read her mail to her.

Educational Consultant Lloyd Junor pointed to the need for dictionaries or glossaries of terms in his original feasibility study, and the point was raised again by at least one of the students. The conversion of a dictionary into nonvisual form is too large a project to be undertaken by the Centre, although the staff should endeavour to keep abreast of world developments in this area. Most blind students have access to somebody who can consult a dictionary for them. However, some thought could be given by course teams to listing the meanings of specialist terms, both for sighted and nonsighted students. Perhaps a more realistic solution at this stage however, would be the encouragement of students to establish closer contact with course tutors and difficult or new words discussed with them along with other problematic areas of the course.

Establishing limitations on the amount and type of support a student can expect of the Centre is an issue which must be looked at in terms of the growing philosophy of rehabilitation around the world. A certain kind of student might expect the Centre to provide everything, and immediately, while another might expect no help at all. This must affect the day to day decision making of the staff. While it is very tempting to try to help everyone as much as possible, it must be borne in mind that self help and eventual independence is the aim of most present day rehabilitation programs. The Centre identifies with this principle. The purpose of the Project is explicitly to make it possible for disabled persons to undertake university level study. This has to be done in a way which does not create emotional dependence of students on the Centre or its staff. In view of plans for future expansion, it is recommended that this principle continue to be fundamental to the philosophy of the Project.

Administration and Organisation

The research assistants in the Centre have established a pattern of regular telephone and home visit contacts with the students in the Project. This has proved particularly valuble as a method of identifying and solving problems, as well as being psychologically satisfying for the students. All students remarked positively on this form of contact. As a method of support it is strongly recommended that this practice continue and that it be built into the philosophy and practice of the Centre in the years to come.

Communication channels between the research assistants and the course teams have been good on the whole and apart from an occasional problem of pacing or meeting deadlines, the Centre has enjoyed the fullest interest and

cooperation from the Schools. It is very important that close contact with course teams and tutors be encouraged, even to the extent that Centre personnel attend course team meetings dealing with change or development within the course, and be kept informed of all major decisions applying to the courses in question. The research assistants need also to continue to maintain discussion contact with tutors of the individual students in the Project, as both parties benefit from shared insights into the progress and problems of students working under handicap. For various reasons the initiative for communication must continue to come from the Centre.

Further communication is desirable at this stage with the Development Unit, so that course developers are made more aware of their possible roles in the process of preparing courses for the blind, and that the Centre staff benefit also from the experience and expertise of the course developers. For this reason it is recommended that the staff of the Centre be invited to contribute to the Development Unit seminar series before the end of the year.

Should expansion of the Centre occur in the near future, and the amount of capital equipment needed increase, loss and breakage will become more of an issue than it is at present. It is recommended that a record keeping system be established at an early stage to preclude wastage and loss as the amount of material grows. Equipment should be clearly labelled and a written record kept of its whereabouts.

Another organisational problem which may require further thought as the Project grows is that of unavailability of course team readers. Up to fifty percent of the writers of a course may be abroad or elsewhere at the time a course is being adapted for audio recording. In the past, the extra burden has fallen to other members of the course team or to volunteers with an interest in the course. On one occasion a course team writer from another university was asked to read his own work in exchange for a consultancy fee. However, there have been occasions when nobody could be found to modify and read courses, and recordings have been held up. In the circumstances it is suggested that emergency funds be made available for the services of readers who may have to be contracted to modify and read parts of courses at short notice. Further to this, it would be realistic to establish a pool of trained readers, who could be called upon at short notice and paid for their services.

The staffing structure of the Centre during the developmental and pilot stages was based on two part time research assistants, whose initial brief to advise on adaptation of three courses has expanded to include all aspects of liaison, counselling, administration, materials development and organisation of the Project. As early problems have been solved new ones have opened up and at the time of writing the staff are already deeply involved in planning for 1982. As the staff work load has increased and diversified so has the disruption of the fifteen hour working week and the fragmentation of the decision making process as mentioned in Part I. The traditional academic staffing structure of research assistants answerable to a Project director, or in this case to the Head of UCS and to the Dean of Educational Services, is becoming less appropriate as the Centre achieves a character and identity of

its own. It is recommended therefore that the staff structure be reexamined from the point of view of (i) increasing the number of working hours involved; (ii) facilitating the decision making process; and (iii) separating the staff structure from the traditional academic model.

Part 5
The Students - (Eight Case Studies)

1 Student A has multiple sclerosis, and a brain tumor. The brain tumor left her with severe optic nerve damage which means that while she has some vision, her sight cuts out completely after short periods of strain, and she suffers from headaches. She is classified as legally blind. The partial removal of her tumor in 1979 interfered with speech related areas of the brain and left her slightly dislexic. She had to reteach herself to articulate in writing and she had speech therapy to correct her damaged speech patterns. She is forty-eight years old and lives in a small house in Melbourne with her mother.

She first enrolled as an off campus student in 1978, and had obtained a credit in *Religious Experience* Part I and distinctions in *Images of Man B* and *Religious Experience* Part II by the time the Project began in 1981. This year she enrolled in *Introduction to Psychology* and the first semester unit of *Images of Man* under the Project's umbrella, and *Symbols and Society* in the second semester. She was not happy with the *Psychology* course, but after a period of negotiation and a disappointing examination done while she was ill, she has decided to continue with the second part. She obtained a credit in *Images of Man* A.

With success studying with both modified and nonmodified courses, she can compare the two. In particular the taped materials have caused her noticeable physical relief, and have enabled her to increase the amount of detail she can cover. The use of the tapes has greatly boosted her confidence in spite of continuing health problems.

Student A is highly intelligent, but undemanding and unassuming. She has a good memory and appears to have a natural aptitude for humanities subjects. She has approached the post-operative stages of her study as an opportunity to increase her logical thinking and intellectual capability. Improving her study methods has become an extension of her earlier efforts to retrain her impaired language facility. Two cassette tape recorders have been provided by the Centre and she uses the tapes in the courses which are available. She does not use the self-help note taker tape, but normally relies on her memory to compose her assignments. She has her own typewriter and types her assignments. Her study load is organised according to her health. Although she does some study every day it is not a regular timetable, nor can she foretell from day to day whether she will

feel well enough to achieve what she sets out to do. She listens to the tapes as often as she can, and in fact plays them when she doesn't feel like doing anything else.

She does not attend any tutorials as the difficulties of getting there and back outweigh the advantages of tutor contact, but she once attended a Weekend School at Geelong. She rarely contacts tutors or lecturers, as she feels that by the time she's formulated the questions she wants to ask she's usually found the answer for herself. She contacts staff at the Centre when necessary but she says she 'doesn't want to worry people'. A friend who has done *Images of Man* lives nearby and she has discussed the course with him, and with one of the other students enrolled under the Project. Her mother supports her efforts as far as she's able to.

Obtaining her degree is very important to Student A. It is a way of extending and developing her mind as her physical ability fails. She hopes to take *Life in Words* next year, and possibly another Psychology course if she passes *Introduction to Psychology*.

2 Student C is twenty-two years old and has attempted to enrol at Deakin University for the last three years. She lives in Melbourne with her parents and is working as a switchboard operator with the Health Commission. She is legally blind, having seven to eight percent normal vision.

She did HSC Chemistry and Mathematics prior to university entrance. The Burwood Blind School had assisted her with her study and provided tutorial assistance. She did well and was encouraged to enrol as an on campus student in a science program at Deakin University in 1979. There she did not have the individual support she had been used to, and found her contracted vision a considerable handicap. University staff and the RVIB were sympathetic and supportive, but on one, least of all herself, were prepared for the demands of a blind person trying to do a science degree on campus.

RVIB had a TV magnified microscope designed and built for her at considerable cost, but when it was ready early in 1980, there were found to be compatability problems with the video link up at Deakin. These were not solved until near the end of the first semester, and by this time she had withdrawn from most of her 1980 courses.

She was invited to enrol in *Introduction to Psychology* as an off campus participant in the pilot project in 1981, but family and personality problems interfered from the beginning. She didn't complete her enrolment papers and was asked to withdraw from the Project.

She says she would like to do a university degree sometime, but feels she was 'too unsettled' to have made full use of the opportunities she was offered by the Project this year.

3 Student I was seventy-six years old when she died in August. She was still enrolled in the Project, although she had not kept up with her work as she became increasingly ill. She was legally, but not totally blind. She had previously taken an Honours degree at Monash University and had enjoyed it. When she began to lose her sight in 1980, she decided to try to do a second degree. RVIB advised against doing it at Monash because she had very little home support, and would have had trouble finding readers. So she applied to Deakin University and entered the Project to take *Imperialism: The Expansion of Europe.*

She was provided with a tape recorder, a modified typewriter with cartridge, audiotapes, raised models and a multiple choice answer box.

Student I was an intelligent woman, with a strong demanding personality and was expected to do well, but soon after she began the course she had several falls, breaking two ribs and damaging her spine. From this point her health and her will to succeed went into decline. She became depressed and her work erratic. On her second visit one of the research assistants reported that Student I seemed confused and forgetful. She did not complete her first assignment, and arrangements were being made to extend her coursework over two full semesters, when the Centre learned that she had become bedridden.

At the end of July, her husband reported that she was not at all well and was 'studying very occasionally'. Shortly afterwards she was hospitalised and terminal bone cancer was diagnosed. One of the staff from the Centre was in regular contact with her until the end.

4 Student K lives in Melbourne. She is fifty-three years old and has enrolled in the two semester course, *Images of Man*. She left school initially at fourteen and this is her first attempt at university level work. She took an unexamined RVIB Australian History course last year which aroused her interest and focused her ambition towards a university degree. She has read widely most of her life, and three of her eight children have had university experience.

She is now totally blind and seventy-five percent deaf. She has polyarteritis nodosa which seriously effects her mobility and is under constant medical care because of recurrent secondary infections. She is taking cortisone which is inevitably softening her bones. She feels the cold and sits constantly in front of the fire.

She has an alert and hungry mind, a good memory and wide interests, but is frustrated in her development by physical and social isolation and lack of home support. Her days and hours are filled with her study, which she sees as a way of proving her worth to herself and to others. 'If I can do it then others will be encouraged to do it too.' she says. 'Disabled people have to prove to the world that they have minds.' Her need to discuss and

share her work is channelled into telephone contact with other students in the Project, with Centre staff and her tutors. In the words of one of the other sight impaired students, 'Her talks with me were more a social outlet than a need for help with the course.'

Three tape recorders were lent to her by the Centre, and she had one of her own. Initially she had difficulty distinguishing her tapes and had technical problems causing tape breakage and accidental erasure. The use of four recorders helped her work out a system of distinguishing the tapes. The mobility of her hands is decreasing and she has the use of only her little fingers left. A modified lever system was developed by the Centre to enable her to operate the play and record buttons more easily and without pain. She cannot write, and she speaks her assignments directly onto tape. She is very critical of her standard, feeling for instance that she 'repeats herself' too much, but she achieved a credit for her first semester work. She attempted to use the self work tape at first, but felt it was making her more confused. She now relies on memory for compiling her assignments, and she feels her memory skills are improving. After one semester's work, her tutors are convinced that she is a highly intelligent woman who has only to overcome her communication problem to prove her full worth.

Attendance at Weekend Schools is out of the question because of Student K's severe mobility handicap. She has suffered a lot of pain since she started studying and tends to become depressed. She is taking a number of drugs and frequent changes in dose and type of drug cause interference to her study patterns. 'I was sitting there crying while I was trying to do my Camus essay,' she remarked. However, she is determined to struggle on, listening to each of her tapes three or more times before absorbing them to her satisfaction.

She is aiming for a degree and feels she must increase her work load to at least six credit units next year if she is to 'finish in time'. She is considering taking *Life in Words* and *Imperialism* next year and will probably major in philosophy. She is completely reliant on the courses on tape produced by the Centre, as there is no other way she can proceed with her study.

5 Student L is twenty-four years old and lives with her parents, sister and brother at Bacchus Marsh. She finished her HSC in 1976 as her illness was establishing itself. She took YWCA courses in Creative Writing and Children's Literature and was doing a writing course with Collier-MacMillan when she read about the Deakin University Project in April last year. She wrote to enquire and was accepted into the pilot project by the Centre. Most of her secondary education was done as a correspondence student, and she feels she had a number of study skills which have proved useful to her endeavour this year.

She has Collegan's disease which has caused her muscles to tighten and calcify. She is confined to a wheelchair and is dependent on others to

move her around. She experiences weakness and some pain with writing and tires quickly. She cannot bend or turn, but she can hold a pen and has been able to increase her writing speed to match the requirements of her study. She would, however, need special arrangements if she had to write a three hour exam paper.

She has an enthusiastic, confident personality and gives the impression of assurance and self sufficiency. 'I like to be as independent as I can,' she remarked. She had reconciled herself to being tied to the solitude of her desk at home when the Project reopened new possibilities for a career. She hopes to major in Psychology and re-explore the possibilities of becoming a teacher now that attitudes towards disabled persons are changing. She is an active member of the local IYDP committee, and she has given a number of lectures to local organisations and interested groups.

The Centre provides no special equipment or taped materials for her, and in this way she is different from other students in the Project.

The Centre, however, has been instrumental in having an access ramp built at Vines Road so that she can attend tutorials in her wheelchair. She wishes to study on campus as a residential student next year, and the Centre has looked into the attendant problem areas of accommodation, transport, a motorised wheelchair, lifts and further access ramps. Student L's case has paved the way for expansion of university access for people in wheelchairs. Many of the problems the Centre has dealt with this year will be directly applicable to similar cases in the future.

Student L has had the use of an APEX car and driver to drive her to fortnightly tutorials at Vines Road. She attended the Weekend School in the first semester, and she made arrangements with a fellow student to visit Waurn Ponds to view the video tapes associated with her course. She has consequently had more university and student contact than the other Project students. 'I think it's important,' she said. 'That is why I want to move on campus next year.'

She did the first semester *Introduction to Psychology* exam at home and has an accumulated result of distinction to this stage. She is highly motivated and has the academic potential to complete her degree.

6 Student M is twenty-nine and married. She has been totally blind for two years. She was previously a primary school teacher. Returning to study appeared a way of overcoming the frustration caused by her blindness. She enrolled in *Imperialism: The Expansion of Europe*, with the idea of 'trying it out' rather than doing an exam or working towards a degree.

She has a vivacious, determined personality, displaying an impatience to get on and do things '. . . just to prove I can.' She does her own housework and cooking, and she dresses and grooms attractively. She has enrolled in a macrame course and is on the local IYDP committee.

She takes an almost agressive pride in proving that being blind doesn't make a person helpless. She reported being delighted when a neighbour asked her recently to help with a children's birthday party. She says she wants to have a child of her own.

Regarding the course, she says she was not ready. She rushed into it '. . . to fill the time and stop me feeling useless,' but she did not have the necessary skills, or the patience to learn them. She had resisted learning braille and she now found she could not make legible hand written notes; she could not use the self work tape; she had difficulty sorting out the course tapes; she confused the play and record buttons on the tape recorder and she broke several tapes; she had trouble settling down to listen to the tapes and complained of headaches and depression.

Family affairs eventually prompted her to withdraw from her course, but with the number of problems she had, and a most unclear idea of her direction, she was destined from the beginning to be unsuccessful.

In hindsight, she has a clearer idea of the skills she will need if she is to try again, and for this alone, her time in the Project can be considered worthwhile.

7 Student P has been totally blind from birth, and because of her highly developed life skills, has adjusted more readily to the demands of tertiary study than the other sight impaired student under the Project. She is thirty-eight years old, and is married to a man who lost his sight in adulthood. They have two sighted children, thirteen and eleven. Her husband is Director, and she Associate Director of an organisation called the Christian Foundation for the Blind. She works at the Foundation head quarters from 9.30 am to 3 pm each day, and runs a busy schedule of local, interstate and even international lecture tours. She is highly active and has a very full life. She lives with her husband and children in a house in Melbourne, bought about a year ago.

Study for Student P is a recent hunger. She did HSC English last year, and made enquiries at RMIT about a writing course, which she thought might help her with her work. RMIT recommended the Deakin University project, and she enrolled in *Images of Man*.

She has two tape recorders and an electric typewriter supplied by the Centre, and studies exclusively from the tapes. She reads braille, for utility reasons rather than 'for pleasure', and she can write. She prefers to type her assignments, but she needs someone to proof read them for her. She uses the self work tape recommended by the Centre, and is the only student doing it with any real success.

Student P is highly motivated, very conscientious and well organised. She plans her work schedule by working back from the assignment due date, and organising her work load accordingly. She usually listens to the tapes once only, unless she needs to refer to something specifically for an assign-

ment. She has attended the three Saturday schools held in Melbourne so far, and found them reassuring if only as a method of communication with other students. She needed no physical assistance on these occasions, as she is perfectly happy catching the train and tram, and needs no other help than someone to make her a cup of coffe and help her buy her lunch.

Her husband and children support her in her enterprise, as well as a friend who checks print references and new words for her when necessary. A secretary at her place of work reads her mail and checks her typing. She claims to have become more self contained as she has progressed with the course, and rarely has need of personal contact with the Centre or with the course tutors.

She felt she did not have well developed study skills when she started at the beginning of the year, and managed to borrow some helpful tapes from RVIB. She suggested similar tapes, and possibly instruction on note taking techniques, might be included among the Centre's support services in the future.

Her first two assignments in the first semester were graded distinction and credit, and the indications are that she will do well. She hopes to increase her work load next year and is thinking of doing *Life in Words* in particular, as a sequel to *Images of Man*. She has not formulated her direction exactly, but will discuss possibilities with one of the research assistants. She is definitely aiming to complete a degree.

8 Student S is a young fifty-seven, and lives with her husband on a farm on the south coast. The farm was bought when she began to lose her sight a few years ago as the result of an hereditary disease. Her vision is contracted to a few degrees in front of her. With approximately eight percent vision, she can read large type but cannot read across a page and cannot read for more than half an hour or so without headache or strain.

She is a cultured, hospitable woman, with great enthusiasm for knowledge and discussion. She is widely read, and she continues her hobby of landscape painting even though her sight has almost gone. Her husband is a willing helper. She has great drive and enthusiasm for life, and is ambitious to succeed in her studies and complete her degree 'as soon as possible'.

Student S enrolled in *Images of Man* last year without the aid of the Project, and passed the two semester courses with a credit and a high distinction respectively. She enrolled in two further courses this year but when she heard about the work of the Project, she decided to attempt at least one of the courses the Centre was offering in its pilot program. She is doing *Imperialism* under the auspices of the Project, as well as *Australian Cities* by herself.

Her assignments this year have all received a credit grading, but she is anxious to try to improve. *Imperialism* is examinable and arrangements were made to allow her to write her exams at home, with extra time if she

tired. She hand wrote her first semester exam on specially printed dark lined paper, and she finished within the normal time. She achieved a credit grading.

Two tape recorders have been provided for her, and she normally uses one for the Study Guide and one for the Reader. She also uses the programmed multiple choice answer box, which she describes as '. . . a superb idea', and raised models, which she is not as happy about. She appreciates having all the books sent to her, so that a sighted person can help her refer to relevant sections when necessary.

She uses the self work tapes for completing questions and exercises and for taking brief notes, but does not feel she uses it well. She relies a lot on memory to organise her assignments, but she does have enough sight to hand write several drafts before typing the final version. She says she writes 'very badly', and prefers to use coloured paper so she can see the edges more clearly. She has attended several Weekend Schools at Deakin University and in Melbourne, and although she found them tiring and the number of people rather confusing, she felt the input from the tutors and lecturers interesting and helpful. Her husband took her to these sessions and sometimes stayed with her to help her find rooms and negotiate stairs.

On several occasions she has tried to ring her tutor but has rarely succeeded. She has found the Centre staff encouraging, although she feels her need for support becoming less as she gains confidence. However, she does contact the Centre regarding possible improvements as they occur to her, and intends to discuss her choice of courses for next year. One of her sons completed a degree course at Melbourne University last year and he is encouraging and enthusiastic for Student S's continuing success, as is her husband.

She is happy and well adjusted in her study endeavour, and should have little problem completing her degree if the Centre can be of at least partial assistance to her over the next few years.

Conclusion

It is clear from the foregoing report that the Project is successful. Course materials have been appropriately modified. Support services have been developed. Students have been enrolled and are performing successfully. Indeed there is now a clearly visible 'Centre', albeit a modest one, where visitors can see the work being done. This success was not achieved by transforming only those courses that could most easily be adapted to another medium. Courses were selected deliberately to include some that presented the most difficult problems both for the student and the transformer. Students were not selected on the basis of optimal chances of success. The students in the project were all severely disabled and represented a range of problems. Nor was the work done with an abundance of resources but rather in a situation of constrained finances and limited time. Despite these circumstances the project must be adjudged successful.

This is not to say that there are not deficiencies and problems. Some of the high aims, notably that of achieving complete and perfect adaptations of material, had to be modified. Much of what was done required 'on the job' learning by staff of the Centre. Delays in getting some things done, such as machine modifications were frustrating. Yet despite these problems it is clearly possible to do the job.

It is therefore necessary and desirable to continue the Project.

Having said that, it is equally clear that providing educational opportunities for the severely disabled is an extremely demanding task. In most tertiary institutions there are some severely disabled students. Much of the assistance they receive is generated on a personal basis although some institutions have made an organised response to the needs of the disabled. Students who enter courses under these conditions tend to be a highly selected group and many cope extremely well with the demands made upon them. However, if the severely disabled are to enjoy 'equal opportunity', whatever that may mean, it is necessary to develop more substantial and sustained support systems.

Doing this involves considerable cost. Whilst it is not possible to estimate accurately the cost of such provision it can be seen that providing students with additional materials, i.e. adapted as well as the standard materials, making regular and frequent contact with them and indeed spending time with them on a one to one basis to deal with administrative, organisational and logistical problems as they arise, all require additional resources. The eight students enrolled absorbed some forty hours a week staff time over and

above the normal teaching and administrative activities. Half of this time was used in adapting materials and so could be amortised over numbers of students during several years. It is probably true that with increased enrolment some economies could be achieved by more small group support. Similarly, equipment serves a number of students over a period of years. Support from some government agencies is likely in the future. When all of these factors are taken into account, it would seem that an institution which is going to make a conscious and organised approach to catering adequately for disabled students will be required to spend an extra thousand or so dollars for each student in addition to assistance it receives from other sources.

It is therefore necessary to acknowledge this additional cost and to make provision for it.

The consequences of this are clear. In times of tight funding it is necessary to control carefully the growth of the project. Although there is evidence of considerable demand for such services, the facilities and resources to meet that demand can only be developed gradually. It is also clear that it is better for a few institutions to concentrate on building up a major resource Centre than for every institution to try to do so. Disabled students will continue to enrol in a large variety of programs and institutions should be encouraged to admit them. Nonetheless it might be best if only a small number of centres be encouraged initially to develop the kind of resource centre envisaged in the present project.

Such centres should be set up to include community support and should seek to generate additional funds through public support and charitable trusts, as well as support from other government agencies. This is best done if such centres are seen as semi autonomous units within institutions, visible and separate, but with full institutional acceptance and support.

It is also clear that if centres are set up to provide this specialised support for disabled students, consideration should be given both to a possible teaching and certainly a research role. Severely disabled students represent a special group of people. Just as women's studies and ethnic studies are accepted as having a place in the curriculum, so there may well be developed a course (subject) dealing with disablement and adjustment to it. Such a course could be offered for credit. It is not necessary to say much about research other than that it should be part of such a project.

Finally, there is an imperative which requires the exploration of the context within which the student operates and into which he or she will graduate. The lot of the disabled person is difficult. If, at the end of a long period of study under difficult and exacting circumstances, there is no brighter future for the disabled, the effort may have been in vain. This is not to say that personal growth and development are not important consequences of education. They are. Nonetheless the achievement of independent living depends very much on being able to earn a living. This and related issues require careful exploration.

This report is presented as the International Year of Disabled Persons draws to a close. It is to be hoped that the Project reported here will represent a continuing expression of concern for the disabled and will in a very practical way enhance the quality of their lives.

Appendix

Some examples of materials modification for low vision students

1. Interpreting pictures through sound.

Imperialism: Expansion of Europe. Study Guide A, pp. 92-3.

Set of 7 pictures. Accompany possible audio back- ground setting * with word descriptions. Suggest: — a fade-out of sound at the close of each example (effect)

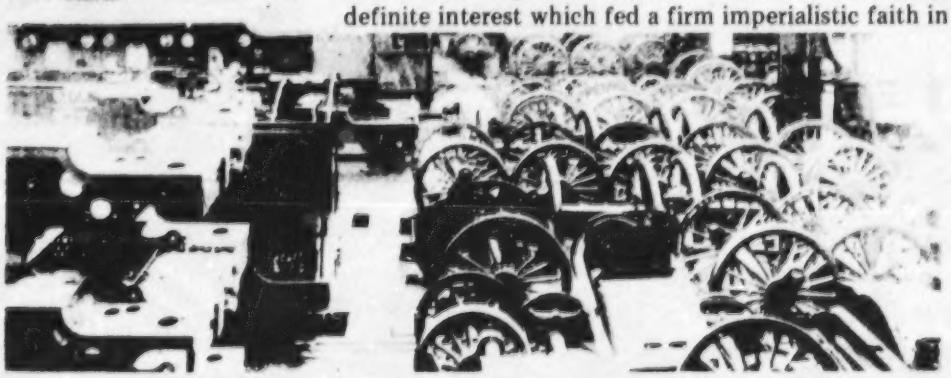
'These pictures relate to Hobson's treatment of imperialism, Extract 4 &5/11 — Reader'. W.D. 'Pages 92 and 93 present seven illustrations of the types of organised groups of people who stood to gain by aggressive Imperialism and the militarism it involved.

A . . Audio background · Factory sounds · (armament manufacturers)

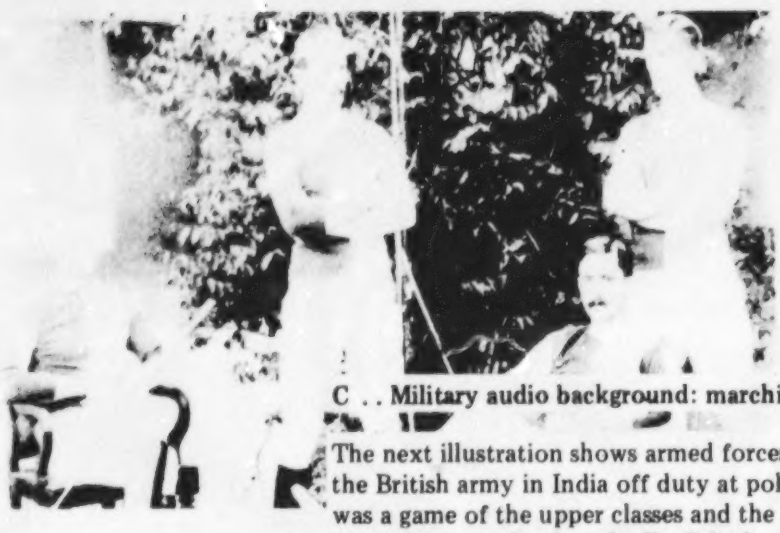
'Armaments manufacturers hammering a steel billet in the Krupps works, Essen in 1880 reflects the great expenditure of public money upon guns and the potential enormous profit of war.'

B . . Factory · · railway engines — audio background

'An example of companies in export trades is illustrated in railway engines for India under construction in Scotland.' Hobson in Extract 4 & 5/11 notes that the making of railways and other manufacturing ventures stimulated a definite interest which fed a firm imperialistic faith in their owners

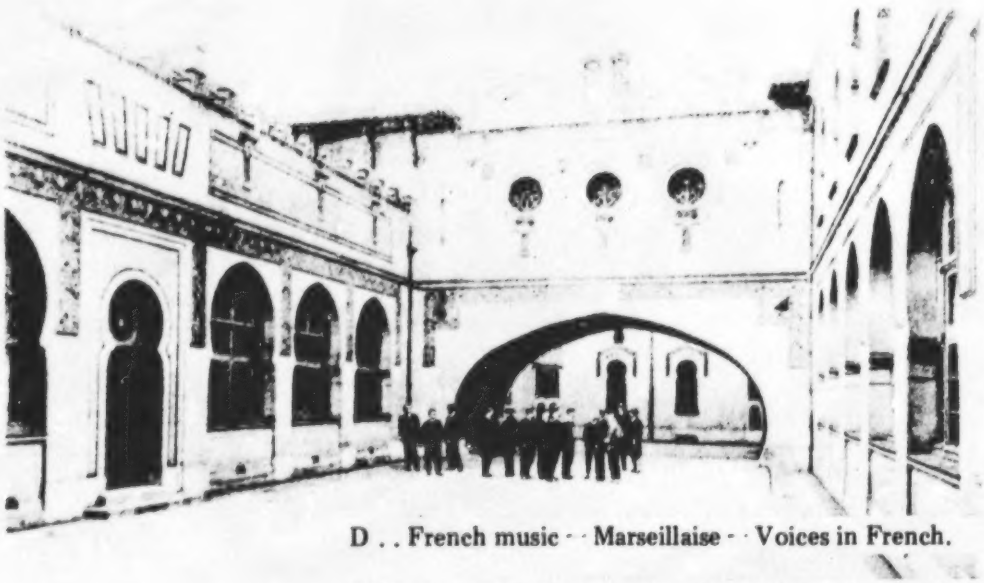


*Challenge to Audio Dept. — creative ideas?



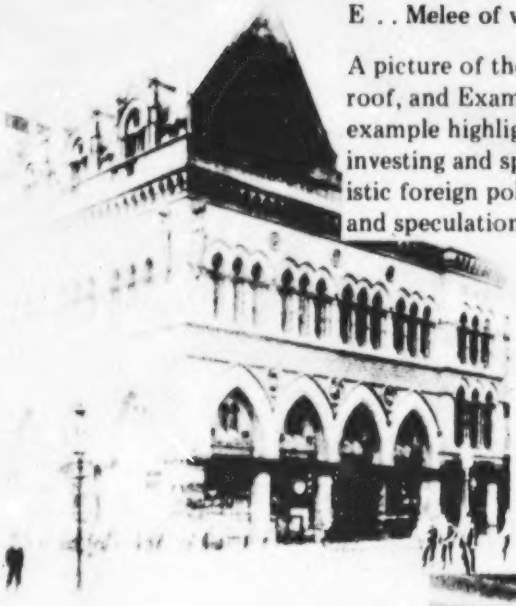
C . . Military audio background: marching/drums/bugle calls etc?

The next illustration shows armed forces and colonial civil service officers of the British army in India off duty at polo. The implication there is that polo was a game of the upper classes and the British officers necessarily came from the upper level of the English class system. Hobson (in Extract 4 & 5/11) comments that the services were imperialistic by conviction and by professional interest and that every increase of the army, navy and air force enhanced the political power they exerted.



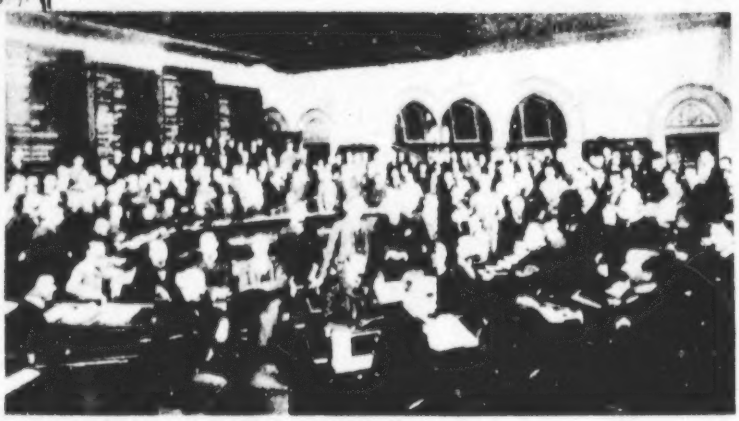
D . . French music - - Marseillaise - - Voices in French.

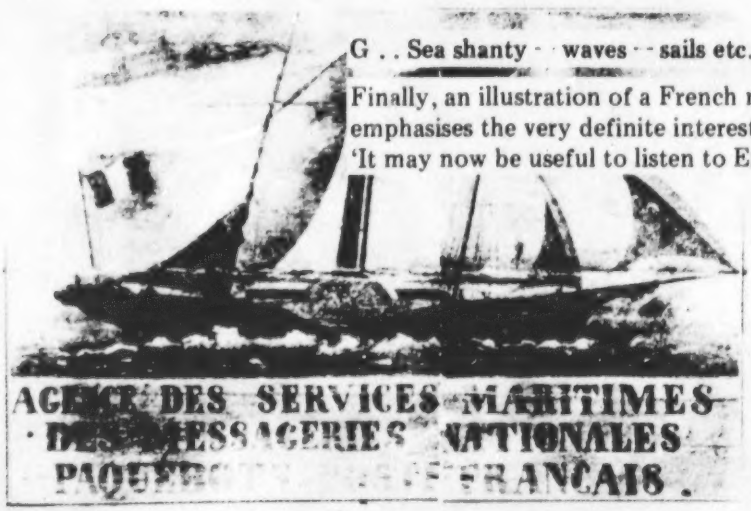
This illustration depicts the group of the professional classes and shows the training of civil serviants for colonial service at the Ecole coloniale in Paris. Hobson notes that the Indian Civil Service could be added to the military services and that every expansion of the Empire was also regarded by these classes as creating new opportunities for their sons.



E . . Melee of voices · · 2 or 3 callers · · etc etc?

A picture of the Glasgow Stock Exchange includes a telegraph mast on the roof, and Example F presents the Floor of the Exchange in 1914. This example highlights the role of the investor. Hobson points out that the investing and speculative classes desired Great Britain to pursue an imperialistic foreign policy in order to secure new areas for profitable investments and speculation.





G . . Sea shanty · · waves · · sails etc. etc.

Finally, an illustration of a French mail carrying vessel using steam and sails emphasises the very definite interest of the shipping trade in Imperialism. 'It may now be useful to listen to Extract 4 & 5/11 Hobson -- Imperialism'.

2. Reinterpreting a table.

Imperialism: Expansion of Europe. Study Guide A, p. 106.

Question No.	Question	Kautsky	Luxemburg	Lenin
1	Definition	See p. 101 Striving by capitalist powers to annex agrarian regions.	See p. 101 No clear definition. Mechanism by which capitalism realised profits from non-capitalist groups.	See p. 102 Stage in the development of capitalism.
2	Consistency	Yes?	Yes	Dubious. Does he treat imperialism as a policy too? Extract 4 & 5/20
3	Assumptions	Materialist conception of history—see p. 100 and Extract 4 & 5/15.		
4	Testable deductions	Only way of ending imperialism is abolition of capitalism.	Capitalism cannot survive without non-capitalist groups.	Doubtful if any testable deductions can be derived directly from Lenin's theory. [8]
5	Tests	Has imperialism in K's sense come to an end and capitalism survived?	Criticism of internal logic of this argument. Has capitalism survived despite comparative unimportance of non-capitalist groups.	——
6	Accept Reject or modify	Probably reject in this form. Otherwise redefine imperialism.	Reject on both grounds?	——
7	Other virtues	——	——	A means of organising thought for political purposes.
8	Relationship to other theories	Eurocentric. Quite close to Hobson's theory.	Eurocentric. Very abstract. A unique attempt at deduction from Marxist theory.	Different in character from Hobson's theory, with which it has often been linked. Shaky factual basis. See below p. 107

8 Lenin's main thesis that imperialism is a stage in the development of capitalism does not give rise directly to any very obvious testable propositions. But aspects of the theory, such as the role of surplus capital in generating foreign investment and the extension of colonial control, can be formulated as testable propositions. The results of such tests will be discussed in Week 11. See also H. Magdoff, 'Imperialism without Colonies' in Sutcliffe and Owen, *Studies in the Theory of Imperialism*, pp. 147-55.

Modified

'Now follows a discussion on comparison and contrast in the theories of Kautsky, Luxemburg and Lenin, using the tape of analysis previously described on Page 91. You may at this stage first refer back to the model to refresh your memory, keeping in mind the types of questions on theory definition, consistency, assumptions, tests and predictions and relationships with other theories.

Thus, for example, we might ask of each of these Marxist theorists, what is his or her definition of imperialism. Kautsky on Page 101 described imperialism as the striving by capitalist powers to annex agrarian regions. Luxemburg provides no clear definition, though she talks about the mechanism by which capitalism realised profits from non-capitalist groups. For Lenin, imperialism was very clearly a stage in the development of capitalism. (The viewpoint is described on Page 102.)

Turning now to the consistency of usage, one queries whether Kautsky adheres to his definition. As Kiernan points out on Page 146 of the Reader, Kautsky left open the question whether imperialism was an aberration within capitalism or whether it was an intrinsic feature of capitalist development. Luxemburg by contrast is consistent in her approach while Lenin occasionally seems to be on the verge of the behaviour for which he criticised Kautsky. In Extract 4 & 5/20, he seems to treat imperialism as a policy, not a necessary feature of capitalism.

As far as their assumptions go, all three Marxist writers derive these from the materialism conception of history discussed on Page 100 of the Study Guide and in Extract 4 & 5, 15.

Some testable deductions can be derived from Kautsky's theory. Is the only way to end imperialism, therefore, to effectively abolish capitalism? It would, of course, be extremely difficult to carry out such a test. Similarly in the theories of Luxemburg, if it could be demonstrated that capitalism could not survive without non-capitalist groups, then this would lend support to her theory.

In the case of Lenin, few, if any testable deductions can be derived from the identification of imperialism with a stage in the development of capitalism. However, the role of surplus capital in generating foreign investment, one aspect of this theory, can be forumulated as a testable proposition. The results of such tests will be discussed in Week 11. Refer also in your set text to H. Magdoff, 'Imperialism without Colonies' in Sutcliffe & Owen, *Studies in the Theory of Imperialism*, pages 147 to 155.

The next area for discussion involves the testing of the theories. For Kautsky, the following question could be posed. Has imperialism in Kautsky's sense come to an end and has capitalism survived? For Luxemburg, a criticism of the internal logic of her argument could be applied. Has capitalism survived despite comparative unimportance of non-capitalist groups?

To accept, reject or modify the theories, Kautsky's in this form would probably be rejected, or alternatively a re-definition of imperialism could be considered. Luxemburg's could possibly be rejected on both grounds of logic and non-capitalist groups. Lenin's theories could be viewed as a means of organising thought for political purposes, although from some quarters this might be regarded as a vice!

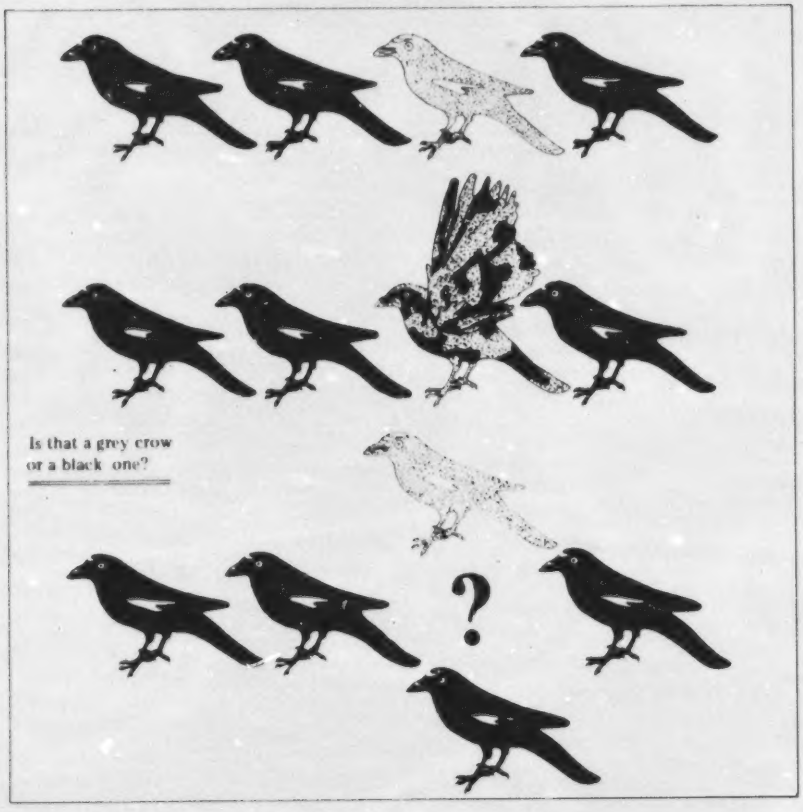
The relationship to other theories would view Kautsky as Eurocentric, and quite close to Hobson's theory. Luxemburg's theories are also defined in these terms as Eurocentric, very abstract and a unique attempt at deduction from Marxist theory. Lenin's theory is seen as different in character from Hobson's theory, with which it has often been linked, although on a shaky factual basis. This point will be developed on page 107.

We will now proceed to the broader issues arising from this discussion and begin with five possible levels of criticism.

Continue Page 107 — Discussion:- 'The five levels of criticism are as follows:—

3. Substituting verbal for visual concepts.

Imperialism: Expansion of Europe. Study Guide A, p. 85.



Modified

To illustrate an example of a choice of this nature it may be helpful to think in terms of our semantic word map of, for example, the dog and cat hierarchy:— that is, the pictures which appear in the mind when we encounter the words dog and cat. The language theory states that a dog is a member of a class of canines, has certain attributes which may vary (a tail, four legs and barks) and has relationships with other concepts which share class membership or properties. Thus a cat and dog have some common properties such as four legs and a tail. However, if we were to encounter a four legged furry animal who barks, do we then reject the theory of our word concept of dog and cat, or do we question our own powers of observation? Did we hear correctly in the first place, and did we make accurate observations of the properties of the animal? Or can we reject the theory of the word concepts of cat and dog and form a new concept (or animal) to match more accurately the observations we have just made? (Continue Line 17) 'Are there any grounds for deciding whether it is the theory or the observation which is the source of the problem?'

4. Extracting salient information from numerical data.

Imperialism: Expansion of Europe. Reader A, p. 127.

	Number of Colonies	Area. Square Miles		Population	
		Mother Country.	Colonies, &c.	Mother Country.	Colonies, &c.
United Kingdom	50	120,979	11,605,238	40,559,954	345,222,239
France	33	204,092	3,740,756	38,517,975	56,401,860
Germany	13	208,830	1,027,120	52,279,901	14,687,000
Netherlands	3	12,648	782,862	5,074,632	35,115,711
Portugal	9	36,038	801,100	5,049,729	9,148,707
Spain	3	197,670	243,877	17,565,632	136,000
Italy	2	110,646	188,500	31,856,675	850,000
Austria-Hungary	2	241,032	23,570	41,244,811	1,568,092
Denmark	3	15,289	86,634	2,185,335	114,229
Russia	3	8,660,395	255,550	128,932,173	15,684,000
Turkey	4	1,111,741	465,500	23,834,500	14,956,236
China	5	1,336,841	2,881,560	386,000,000	16,680,000
U.S.A.	6	3,557,000	172,091	77,000,000	10,544,617
Total	136	15,813,201	22,273,858	850,103,317	521,108,791

Modified

HANDICAPPED
General Worksheet

Course: SS 102
Volume: Reader A Weeks 1-6

Handicap: Visual

Page	Transformation	Details
127 Hobson Imperialism 4 & 5 10	Table:– Colonial possessions. Word Description:	'The table in Extract 10 relates area and population of the 'Mother Country' to its colonies. For example, Britain with 50 colonies had a land area of approximately 120,000 sq. miles, while the colonies occupied approximately 11 million square miles. Thus the area occupied by the colonies was 100 times as big as that of the mother country. Similarly British population was 40 million, but the colonies had a population of 345 million, at least 8 times as big as the mother country population.

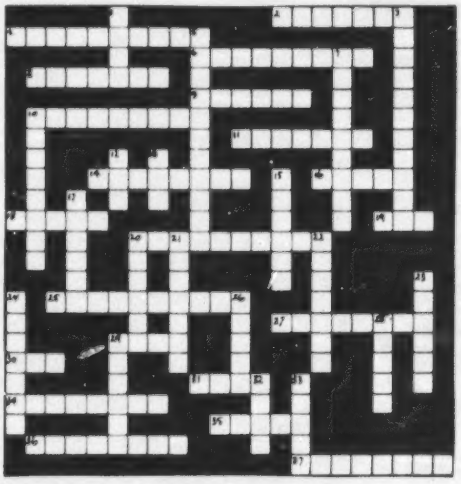
58

5. Changing a crossword into a quiz.

Introduction to Psychology. Student Workbook 1, pp. 84-5.

Summary Crossword

In this section you have been introduced to many new terms and concepts. This crossword aims to test how well you have been able to remember them. It also has the added advantage of testing whether you can spell them. Try this at first without the aid of your notes or Hilgard, Atkinson and Atkinson. If you get stuck, then try to find the answer in the book. As a last resort the answers are at the back of the answer section. Good luck!



ACROSS

2 Transmission of impulses between neurons takes place by means of chemicals contained in the terminal _____.
4 The father's _____ contribution determines the sex of the child.
6 This gland has been called the master gland of the autonomic system.
8 This sytem contains all the nerves of the body.
9 The basic unit of the nervous system.
10 The name for glands which secrete hormones.
11 The name for the junction between neurons.
14 It is in the _____ cortex that all complex mental activity takes place.
16 This hemisphere has also been called the minor hemisphere.
18 A chromosome is made up of many little heredity units called _____.
19 A skeletal muscle neurotransmitter.
20 The name for the central core area which regulates movement.
25 The process which makes a neuron more likely to fire.
27 The fibres connecting the two hemispheres are known as the corpus _____.
29 This structure carries impulses from the cell body to the terminal buttons.
30 _____ adrenaline prepares the body for emergencies.
31 The spinal cord connects to the brain at the brain _____.
34 The name for the technique which involves the systematic removal of parts of the brain.
35 The man who discovered the speech area.
36 The left hemisphere is also known as the _____ hemisphere.
37 The name for the part of the neurons that receives impulses from other neurons.

DOWN

1 Identical twins are also called _____ zygotic.
3 The _____ system accelerates heartbeat during emotional excitement.
5 The inner core of the adrenal glands secretes _____ .
7 Blue eyes are caused by _____ genes.
10 These neurons carry outgoing signals from the brain.
12 Some genetic disorders only occur in males. These are _____ linked disorders.
13 The name for the records of total brain discharges.
15 This substance speeds up nervous transmission.
17 The knee jerk response to a tendon tap is called a _____ .
20 The wrinkled part of the brain.
21 The base line potential of a neuron is known as the _____ potential.
22 The central core area which controls breathing.
23 The hippocampus is part of this system.
24 The name for a lobe of the brain.
26 A _____ is a bundle of elongated axons.
28 The reticular centre is one part of the brain that controls _____ .
29 The nerve impulse is known as an _____ potential.
32 The endocrine system plays an important role in _____ .
33 This can secrete a hormone.

If you get through this successfully then rest back on your laurels and just think. Now your brain knows quite a bit more about itself. You also will now understand what people meant when they said

(1) If he had half a brain it would be lonely.
(2) You need to sit down and knock a few neurons together.
(3) He has a good supply of gray matter.
(4) Don't let your left hand know what the right hand is doing.

You also may have developed a new regard for sheep!

Modified

Summary Quiz

In this section you have been introduced to many new terms and concepts. This quiz aims to test how well you have been able to remember them. Try this at first without the aid of your notes or Hilgard, Atkinson and Atkinson. If you get stuck, then try to find the answer in the book. The number of letters in the sought after word, or the number of words, are given to you as a clue. As a last resort the answers follow the activity. Good luck!

1 What contains the chemicals which allow the transmission of impulses between neurons? 2 words, 8 & 7 letters.
2 What, in the father, determines the sex of the child? 10 letters
3 This gland has been called the master gland of the autonomic system. 9 letters
4 This system contains all the nerves of the body. 7 letters
5 The basic unit of the nervous system. 6 letters
6 The name for glands which secrete hormones. 9 letters
7 The name for the junction between nuerons. 7 letters
8 In what part of the cortex would you find all complex mental activity? 8 letters
9 This hemisphere has also been called the minor hemisphere. 5 letters

10 What do we call the many little heredity units making up a chromosome? 5 letters
11 A skeletal muscle neurotransmitter. 3 letters
12 The name for the central core area which regulates movement. 10 letters
13 The process which makes a neuron more likely to fire. 10 letters
14 What sort of fibres connect the two hemispheres? 2 words, 6 & 8 letters respectively.
15 This structure carries impulses from the cell body to the terminal buttons. 4 letters
16 What sort of adrenaline prepares the body for emergencies? 3 letters
17 What part of the brain connects the spinal cord and the brain? 4 letters
18 The name for the technique which involves the systematic removal of parts of the brain. 8 letters
19 The man who discovered the speech area. 5 letters
20 What is the left hemisphere also known as? 8 letters
21 The name for the part of the neurons that receives impulses from other neurons. 8 letters
22 Identical twins are also known by this term. 11 letters
23 What system accelerates hearbeat during emotional excitement? 11 letters
24 What is the secretion from the inner core of the adrenal glands called? 11 letters
25 What sort of genes cause blue eyes? 9 letters
26 These neurons carry outgoing singals from the brain. 8 letters
27 Some genetic disorders only occur in males. These are said to be linked to what? 3 letters
28 The name for the records of total brain discharges. 3 letters
29 This substance speeds up nervous transmission. 3 letters
30 What is the knee jerk response to a tendon tap called? 6 letters
31 The wrinkled part of the brain. 6 letters
32 What is the base line potential of a neuron known as? 7 letters
33 The central core area which controls breathing. 7 letters
34 The hippocampus is part of this system. 6 letters
35 The name for a lobe of the brain. 7 letters
36 What is a bundle of elongated axons? 5 letters
37 What does the reticular centre of the brain control? 5 letters
38 The nerve impulse is known as this. 2 words, 6 & 9 letters.
39 What does the endocrine system play an important role in? 4 letters
40 This can secrete a hormone. 5 letters

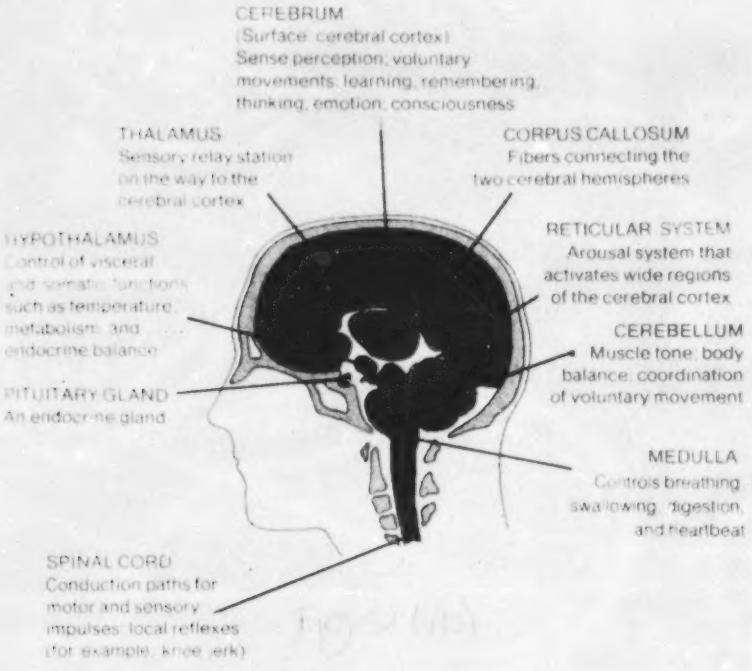
If you get through this successfully then rest back on your laurels and just think. Now your brain knows quite a bit more about itself. You also will now understand what people meant when they said

(1) If he had half a brain it would be lonely.
(2) You need to sit down and knock a few neurons together.
(3) He has a good supply of gray matter.
(4) Don't let your left hand know what the right hand is doing.

You also may have developed a new regard for sheep!

6. Raised models.

Introduction to Psychology. Hilgard, Atkinson & Atkinson, p. 37.


CEREBRUM
(Surface: cerebral cortex)
Sense perception; voluntary movements; learning, remembering, thinking, emotion; consciousness
THALAMUS
Sensory relay station on the way to the cerebral cortex
CORPUS CALLOSUM
Fibers connecting the two cerebral hemispheres
HYPOTHALAMUS
Control of visceral and somatic functions such as temperature, metabolism, and endocrine balance
RETICULAR SYSTEM
Arousal system that activates wide regions of the cerebral cortex
CEREBELLUM
Muscle tone; body balance; coordination of voluntary movement
PITUITARY GLAND
An endocrine gland
MEDULLA
Controls breathing, swallowing, digestion, and heartbeat
SPINAL CORD
Conduction paths for motor and sensory impulses; local reflexes (for example, knee jerk)

Modified